Journal
OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

Opening and Closing Sessions—San Antonio Meeting

The President's Address—*Floyd Cross* 447
Presentation of Awards 454
Tissue Culture in Experimental Biology and Medicine—*C. M. Pomerat* 458
Dr. W. W. Armistead Chosen President-Elect 464

General Articles

Observations on Mucosal Disease of Cattle—*Carl Olson, Jr., and Alvin B. Hoerlein* 466
Erythrocyte Sedimentation Rate and Hematocrit—*C. E. Bild* 471

Surgery and Obstetrics

Three Tumors of the Bovine Uterus—*Joseph Simon and S. H. McNutt* 475

Clinical Data

Actinobacillosis of Cattle—*D. A. Sanders and M. Ristic* 478
A Quill Mite of Poultry—A Case Report—*O. Schwabe* 481
What Is Your Diagnosis? 483
Ecological and Epizootiological Studies on Canine Coccidioidomycosis—*Ajello—Reed—Maddy—Budurin—Moore* 485

Editorial

Veterinarians in Medical Research 491
Practical Field Research 491

The News ..... 493 **Organization Section ..... adv. p. 22**

The Roster ..... adv. p. 34

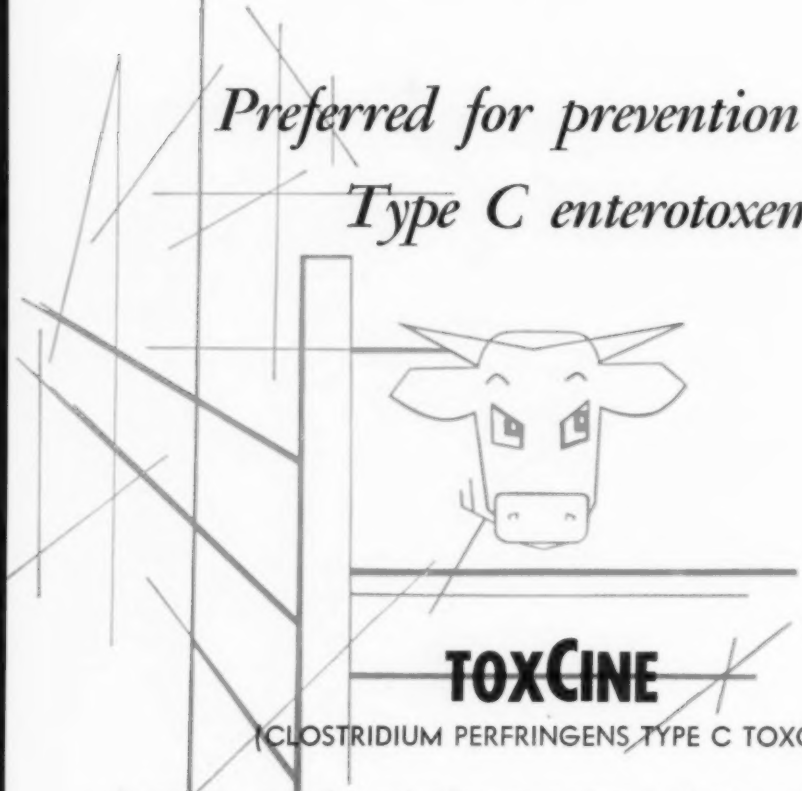
Washington News, adv. p. 8; Coming Meetings, adv. p. 32;
Correspondence, adv. p. 37

Contents continued on adv. page 2

Vol. 129 **November 15, 1956** **No. 10**

Preferred for prevention of

Type C enterotoxemia



TOXCINE

(CLOSTRIDIUM PERFRINGENS TYPE C TOXOID)

A toxoid for vaccination against Type C enterotoxemia of calves and lambs. Use ToxCine for prophylaxis on the bred cow or ewe 2 to 4 months before calving or lambing time. In this manner ToxCine protects the calf or lamb during the period of greatest danger. . .the first few weeks of life when Type C enterotoxemia is most likely to strike.

ANTI-TOXCINE

(CLOSTRIDIUM PERFRINGENS TYPE C ANTITOXIN)

An antitoxin for the prevention and treatment of Type C enterotoxemia of calves and lambs. Anti-ToxCine is a product to be used in emergency situations to stop severe losses in the offspring of non-vaccinated dams. It should be administered shortly after birth. Anti-ToxCine may be used successfully to treat sick animals if they are in the early stages of this disease.

THE Corn States SERUM COMPANY

1124 HARNEY ST. • OMAHA 8, NEBRASKA

★ Carminative

★ Mild Laxative

★ Rumen stimulant

★ Antacid

★ For all species

CARMILAX

Indicated in Gastro-Intestinal Disturbances

CARMILAX provides carminative, mild laxative, rumen stimulent and antacid all in one. One of the safest laxatives for pregnant animals, CARMILAX is indicated in all gastro-intestinal disturbances, large and small animals.

Mixes Easily—Palatable

CARMILAX contains special suspending agents — mixes easily with any water supply. Palatable flavor — patients like it.

High Magnesium Hydroxide Content

One pound of CARMILAX contains magnesium hydroxide equivalent to one gallon of milk of magnesia. Also contains acetphenolisatin, sodium thiosulfate, nux vomica, tartar emetic, capsicum and ginger.

1 lb...$1.25; 12—1 lbs...$13.80; 25 lbs...$22.50; 4—25 lbs...$81.00

Also Carmilax Bolets
Antacid and mild laxative—excellent follow-up for Carmilax Powder. Easy to administer.
50.....$4.75

Norden®

NORDEN LABORATORIES Lincoln, Nebraska

Journal of the American Veterinary Medical Association

CONTENTS

(Continued from Cover)

CLINICAL DATA

A Bovine Mucosal Disease in Britain 481
Turkey Erysipelas and Antibiotics 482
Virus Pneumonia of Pigs 482

CURRENT LITERATURE

Abstracts

Reactions Between Leptospira Species 492
Abscesses of the Pharyngeal Region of Swine 492
Diphtheroid Stomatitis of Chickens 492
Submucosal Glands in the Bovine Colon .. 492

Books and Reports

Annual Review of Biochemistry 492
Dictionary of Dietetics 492

THE NEWS

Veterinarians Invited to Attend A.A.A.S. Symposium 493
U. S. Government 493
Among the States and Provinces 494
Deaths 494

MISCELLANEOUS

Anthrax in the Wyoming Mountains, 470; Mosquitoes and Dirofilaria Tenuis, 474; New Tailless Breed of Sheep, 474; Chinchilla News Resumed, 474; Honeybees Have Real Estate Agents, 474; Tranquilizing Drugs and Fighting Fish, 474.

ORGANIZATION SECTION

Women's Auxiliary ..... adv. p. 22

$15.00 per Annum **Single Copies, $ .75 Prepaid in U.S.**
Canada and Pan American Countries, $15.50; Foreign, $16.50
Published semimonthly at 600 S. Michigan Ave., Chicago 5, Ill., by the American Veterinary Medical Association. Second class mail privileges authorized at Chicago, Ill., January, 1956. Additional entry at Mendota, Ill.

Who pays the freight on "phantom" phosphorus

SOMEONE stands to lose when feeds for today's fast-growing, high-producing animals are formulated with phosphates containing a high percentage of "phantom" phosphorus.

The reason: animals can't utilize "phantom" phosphorus . . . phosphorus that is biologically out of reach.

Today's harder working animals are more dependent than ever on phosphorus from feed supplements. They need more usable phosphorus, and over-worked fields frequently can't provide it in home-grown feeds.

That's why feed manufacturers who are interested in providing complete phosphorus nutrition choose feed phosphorus products carefully. They insist on products of proven availability and effectiveness . . . products like International's chemically processed and purified dicalcium and tricalcium phosphates.

Developed through years of round-the-clock research, they answer today's need for more effective feed phosphorus products. The higher biological availability means more usable phosphorus . . . less "phantom" phosphorus.

For example, numerous research studies clearly indicate that one pound of International's dicalcium phosphate — DynaFOS — delivers as much biologically available phosphorus as 2 to 9 pounds of unprocessed, raw phosphates.

One pound of Dynamic DynaFOS delivers as much available phosphorus as 2 to 9 pounds of unprocessed, raw phosphates...

SPECIFICATIONS	DYNAFOS	SOFT OR COLLOIDAL PHOSPHATE	CURACAO ISLAND PHOSPHATE	BONE MEAL
1 PHOSPHORUS CONTENT	18.5%	9.0	14.0%	13%
2 DYNAMIC (BIOLOGICAL) VALUE	100	Less than 25	70	70-100
3 LBS. OF USABLE PHOSPHORUS PER TON	370 lbs.	Less than 45.0 lbs.	196 lbs.	182-260 lbs.
4 MAXIMUM FLUORINE CONTENT	1,200 ppm	15,000 ppm	5,000 ppm	600-8,760 ppm

International's Feed Ingredient Department periodically sends out technical releases and reprints on phosphate nutrition. If you would like your name on our mailing list, please drop us a post card.

PHOSPHATE CHEMICALS DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

General Offices: 20 North Wacker Drive, Chicago 6

Improved immunizing agent against bovine leptospirosis

'ANTILEPTO'

LEPTOSPIRA POMONA BACTERIN

Annual losses from bovine leptospirosis are more than 112 million dollars—greater than from bovine brucellosis.[1] With a single 5-cc. subcutaneous injection of 'ANTILEPTO', high protective titers develop within 7 days. Protection persists for at least 6 months.[2]

For sale to licensed veterinarians only.

References: 1. Agricultural Research Service, Losses in Agriculture, June, 1954. Table 20, p. 129. 2. Brown, A. L., et al.: Vet. Med. 50:167, April, 1955.

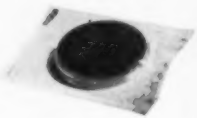
MSD

MERCK SHARP & DOHME

DIVISION OF MERCK & CO., INC., PHILADELPHIA 1, PA.

VETERINARY DEPARTMENT. U. S. VETERINARY LICENSE NO. 3

In the field...or in your clinic



PRE-MED

(prepared medium)

the disposable culture plate sealed in a sterile bag

9 MEDIA NOW AVAILABLE

for routine bacteriology

- Blood Agar
- Chocolate Agar
- E. M. B. Agar
- MacConkey Agar
- S S Agar
- Bismuth Sulfite Agar

for routine mycology

- Sabouraud Dextrose Agar
- Mycosel Agar
- Littman Oxgall Agar

PRE-MEDS are optically clear, scratch-free Petri dishes containing *ready-to-streak* culture media. For maximum shelf life, each PRE-MED is sealed in a sterile polyethylene bag to preserve moisture and prevent air contamination. (Bag may be resealed for prolonged incubation.)

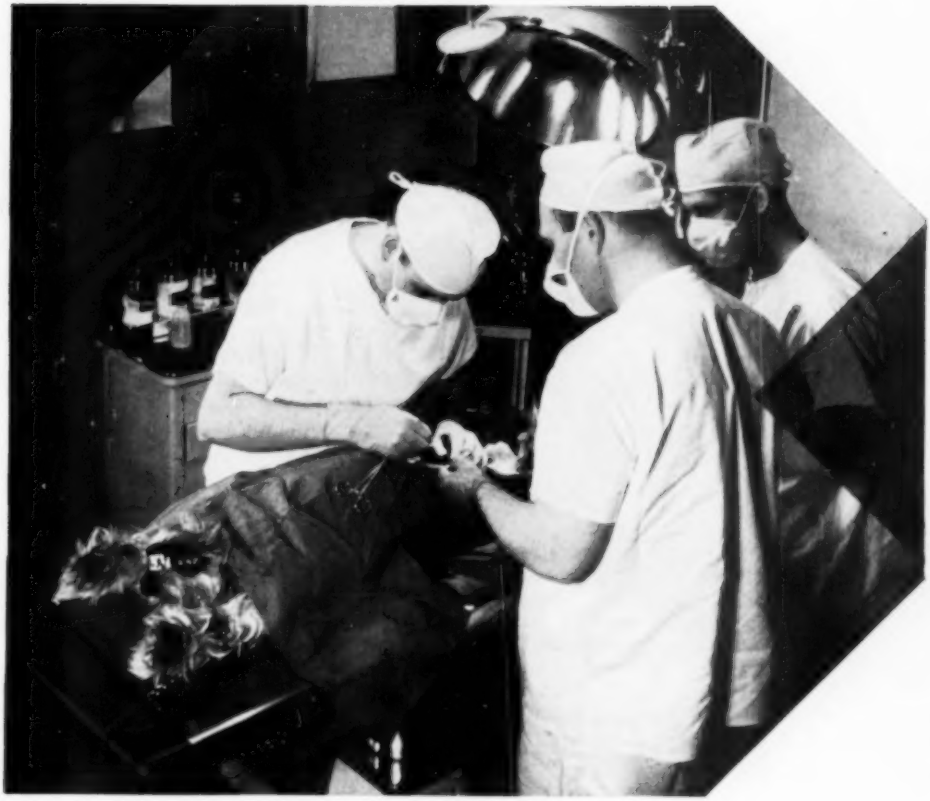
Gone are the tedious hours of preparing glass Petri dishes for re-use. Gone are the troubles that go with mixing your own culture media. Let Hyland do it for you—with modern, controlled, mass production methods. You get perfect, uniform, sterile preparations at what cost-conscious laboratories agree is actually less than "do-it-yourself" costs.

With PRE-MED, even perishable specimens become routine to handle. Simply open a bag, streak the plate, incubate—and after reading, destroy. Enjoy PRE-MED advantages now. In units of 3 plates of any one medium (minimum order) —50¢ per plate. Lower cost in quantity.

Hyland

HYLAND LABORATORIES

4501 Colorado Boulevard, Los Angeles 39, Calif.



First, he figures average dose. He administers about half of it in 20 to 30 seconds. Gives this time to show its full depressant effect. Then, fractional doses— with intermittent pauses— until he reaches

. . . smooth, controlled anesthesia with NEMBUTAL®

When you administer NEMBUTAL, onset of action is prompt, duration and degree of anesthesia are easily controlled. Anesthesia is produced in three to five minutes, lasts 60 to 90 minutes. One-dose administration means no interruptions during operation, no obstructing equipment.

Muscle relaxation accompanying NEMBUTAL anesthesia speeds your operative procedure. Recovery is safe, with virtually no side effects. And animals remain quiet several hours after operation.

Used safely and successfully in veterinary medicine for more than 23 years, NEMBUTAL Sodium Sterile Solution is available in 100-cc. multiple-dose bottles. Abbott

•NEMBUTAL Pentobarbital Sodium, Abbott

News From Washington

ARS called a meeting on November 1 to plan a comprehensive survey and the research required to effect complete eradication of scrapie. Invited to the meeting as consultants were Drs. Wm. A. Hagan, chairman; K. F. Wells and C. A. Mitchell from Canada, Hadleigh Marsh, C. A. Brandly, A. G. Boyd, and W. L. Bendix.

* * * *

ARS will hold a conference in Evanston, Ill., November 26-27, of federal veterinarians in charge for the purpose of reviewing the brucellosis program and to set goals toward certification by counties and states.

* * * *

It is reported that 11 firms desire to participate with the Atomic Energy Commission in developing an experimental center for food irradiation. The preservation by irradiation is of interest, among others, to hospitals as well as to the military services.

* * * *

The National Science Foundation has published an 82-page report on the research and development potential of nonprofit institutes and commercial firms in the United States, based on a survey coordinated by the Maxwell Research Center, Syracuse University, and financed by the National Science Foundation. The report, "Research and Development by Nonprofit Research Institutes and Commercial Laboratories 1953" may be purchased (50 cents) from the Superintendent of Documents, Government Printing Office, Washington 25, D.C. According to the Washington Report for Medical Sciences, three-fourths of the institutes and laboratories were organized since 1941, when the government began expanding its research effort. Expenditure by the institutes in that year totalled more than $53 million, of which $3.3 million went into basic research ($97,000 in medical sciences).

* * * *

At ceremonies in Washington on October 1, the Armed Forces Medical Library became the National Library of Medicine and control passed from the military establishment to the Department of Health, Education, and Welfare, (**see** JOURNAL, April 15, 1956, adv. p. 12). The authority for the official transfer is Public Law 941, 84th Congress. Colonel Frank B. Rogers, M. C., U. S. Army, will continue, at least for the present, as director, having been detailed for this duty to the Public Health Service.

* * * *

Because of the death of Congressman Percy Priest, there is some doubt whether the Interstate and Foreign Commerce Committee will go through with plans for early December hearings into medical education and its financing. The activities of this committee include national health legislation. Unless Republicans control the House in the 85th Congress, the new chairman will be the Honorable Oren Harris, an able and respected member of the House from El Dorado, Ark. (fourth district). Should Republicans control the House, the Honorable C. A. Wolverton, first district, New Jersey, would be chairman.

* * * *

The Internal Revenue Service, in two separate opinions, has ruled (1) that persons giving their services gratuitously to hospitals and churches may consider expenses of transportation and uniforms (cost and maintenance) as deductible charitable contributions. Cost of meals are not included in this liberalization; (2) that travel and other expenses incidental to participation in civil defense activities constitute contributions or gifts within the meaning of Section 170 of the Internal Revenue Code of 1954, and are deductible in the manner and to the extent provided in such section.

Brand New

in America...

CLOSTRIDIUM PERFRINGENS TYPE D TOXOID

...an improved immunizing agent...

protects sheep and lambs against enterotoxemia during entire usual feeding period.*

Thousands of lambs need protection against enterotoxemia* during the feeding season. In its continuing program of research, Affiliated Laboratories has evolved improved processing techniques in the development of its new Clostridium Perfringens Type D TOXOID. These techniques have produced a stable, highly potent, more effective immunizing agent against enterotoxemia*.

This new Toxoid stimulates a much higher average and more lasting antitoxin titer in lambs (and sheep) than results from the use of bacterin. It establishes immunity within 10 days that persists for the usual feeding period.

A potency test is conducted on each serial using lambs as test animals. In addition appropriate biological and bacteriological tests **insure** the potency, purity, safety and sterility of the toxoid.

(Caused by Clostridium Perfringens Type D toxin)

Affiliated

AFFILIATED LABORATORIES CORPORATION

The National Laboratories Corp. — Grain Belt Supply Co.
Corn Belt Laboratories, Inc. — The Gregory Laboratory, Inc.

PRODUCED FOR AND SOLD TO GRADUATE VETERINARIANS ONLY

Now from Pfizer, new most potent steroid high cure rate*, low dosage*

STERANE® Intramuscular-Veterinary

BRAND OF PREDNISOLONE

IN KETOSIS
28 INVESTIGATORS
299 CASES

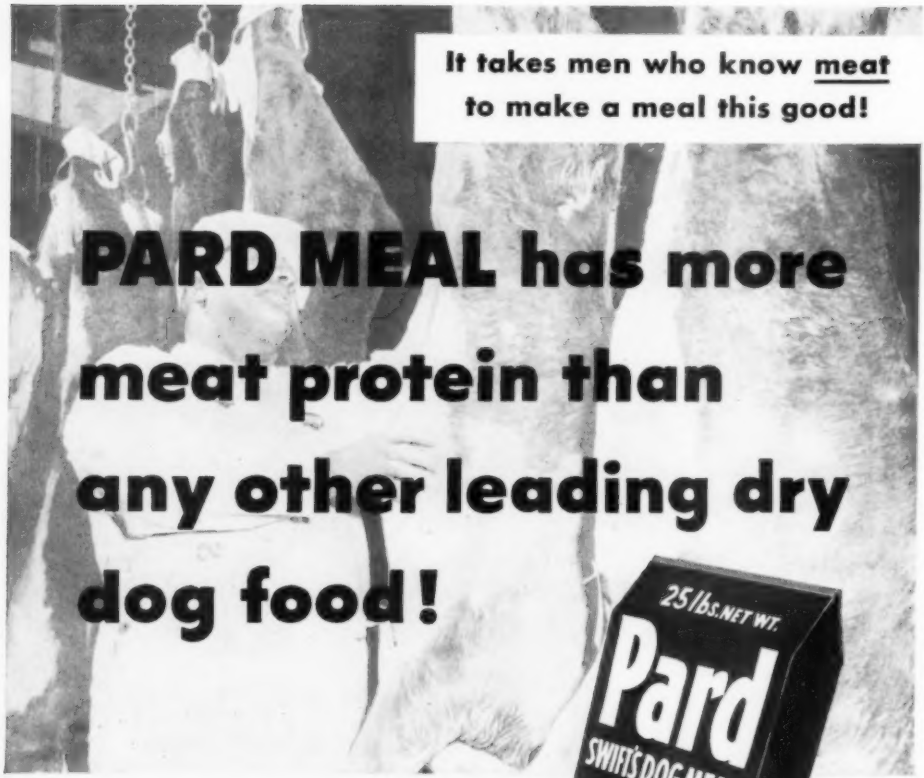
Prompt and complete recovery in 243 cases with a single injection of 50 to 100 mg.

Sold to veterinarians only

Vials of 10 cc.; each cc. contains 10 mg. of prednisolone.

Pfizer

Department of Veterinary Medicine
PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, N. Y.



IT'S CONDENSED! FEED UP TO 25% LESS!

New Pard Meal is so rich in concentrated food value that, pail for pail, *you feed less* . . . up to 25% less than with other leading dry-type meals. See your Swift man's comparative feeding chart.

There you have it—the reason why Pard-fed dogs are healthier dogs! *Laboratory analyses prove that Pard Meal contains more meat protein than any other leading dry dog food.* It's this extra amount of important protein that fulfills a basic requirement in the dog's diet. Because we put more into Pard Meal, you get more value out of using it! Dogs love the flavor, too . . . preferred 2 to 1 in actual feeding tests. Order it in 25- or 50-lb. bags. Pard Meal is homogenized, won't flake, powder or become rancid.

SWIFT & COMPANY

Pard Dept. • U. S. Yards • Chicago 9, Illinois

SURE, SWIFT CANS PARD TOO

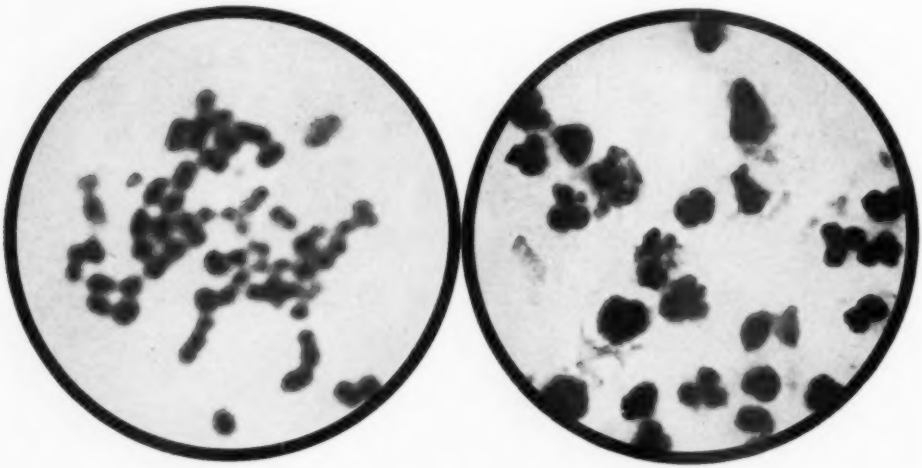
Guess work gone! Pard is all a dog needs or wants. Like Pard Meal, *Swift's canned* PARD is the result of research in Swift's laboratories and kennels. No wonder dogs are clamoring, "Where's my PARD?" It has the GOOD BEEF TASTE that comes from juicy beef variety meats, ground beef bone, and the right amount of beef fat.

Swift

To Serve Your Family Better

CORBIOT*

is indicated in



specific and non-specific mastitis

The infection and concurrent inflammation of specific (infectious) mastitis are attacked by the wide antibacterial activity of the TRIPLE ANTIBIOTICS and the effective anti-inflammatory action of the HYDROCORTISONE combined, for the first time, in CORBIOT.

The inflammation of non-specific (non-infectious) mastitis is effectively treated only by a remedy designed to overcome inflammation. CORBIOT, first with HYDROCORTISONE, is first with TOTAL THERAPY of mastitis – against the infection *and* the inflammation.

FIGHT INFECTION • FIGHT INFLAMMATION • FORESTALL SCARRING • SAVE PRODUCTION

Teatube*-CORBIOT*

Available in tubes of 10 Gm.

*TRADEMARK, REG. U. S. PAT. OFF.

a product of Upjohn Research

VETERINARY MEDICAL DEPARTMENT, THE UPJOHN COMPANY, KALAMAZOO, MICHIGAN

NEW HELP IN MANAGING

SWINE ENTERITIS:

RQ-20

ARMOUR

EASY TO ADMINISTER, EASY TO REGULATE

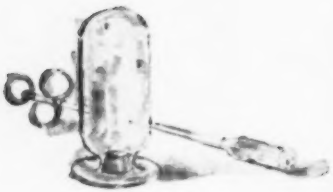
FEED ADDITIVE:

RQ-20 (Armour) contains 20% trimethylalkyl-ammonium stearate, in 80% steamed bone meal. RQ-20 alters intestinal environment favorably, so that it is effective in controlling the symptoms of bacterial enteritis in swine. RQ-20 minimizes stunting effects.

INDICATIONS:

1. **As a growth promotant, in poultry and swine rations.**
2. **As a primary treatment for swine bacterial enteritis in herds showing no systemic reaction.**
3. **As a complementary treatment for swine bacterial enteritis in herds showing systemic reactions.**
4. **To minimize relapses.**
5. **To minimize stunting effects following the outbreak of systemic diseases.**

Veterinary ARMOUR **Laboratories**
P.O. Box 511 Kankakee, Ill.



JOHN McFALL WITH TWIN CALVES he fed, which proved the difference worm control makes. Calf at right looks normal for a 4-month-old, but is 50 pounds lighter than its twin that got "Pheno" in its feed.

Why "healthy" herds need worm control

Cattlemen are becoming increasingly aware of the problem of low-level worm infection in their stock.

Experiment-station work and projects like the one illustrated above are clearly demonstrating that stomach worms hold back the growth of practically every herd in the country. Worm control can produce a definite profit bonus* in beef and dairy herds, even when worm loads are so light as to produce no clinical symptoms.

A two-way program of control with the anthelminthic phenothiazine is recommended. First, use therapeutic doses of the drug to eliminate adult worms; then keep down reinfection and suppress the production of viable parasite eggs with low-level feeding of phenothiazine in supplement, mineral mix or salt.

NEW INFORMATION ABOUT INTERNAL PARASITES, a review of developments in livestock parasitology, is compiled regularly by Du Pont for veterinarians and animal health specialists. For your copy or for specific information on the control of internal parasites with phenothiazine — simply write to Du Pont, Room 4157-D, Wilmington 98, Delaware. Phenothiazine products are available through suppliers of veterinary products.

** Each dollar spent for phenothiazine returned $12 in feed economy and faster gain for John McFall, Mineral Point, Wisc.*

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Phenothiazine

in weeping skin conditions...

VARITON CREAM

breaks the itch-scratch-itch cycle

1) overactive secretion of acetylcholine at nerve endings triggers itching and swelling

2) intensified scratching stimulates further secretion of acetylcholine—with increased edema, vasodilation and pruritus

3) VARITON Cream **blocks this chain reaction**

- **dries oozing lesions**
- **halts itching and scratching**
- **curbs inflammation**
- **helps prevent secondary infections**

Now in 2 sizes

30 Gm. tube: for office use and dispensing

20 Gm. tube: a good dispensing item

Schering

time is a factor in bovine ketosis

METICORTEN*

prednisone

1. **more rapid recovery**
   - puts animals back on their feet usually in 24 hours
   - restores milk production to normal levels or above within 3 to 7 days

2. **single-dose economy**
   - "markedly reduces the usual duration of ketosis as well as the number of repeat visits"[1]

3. **clinically proved effectiveness**
   - of 300 cases of both primary and secondary ketosis "over 81% (243) recovered with only one injection"[2]

effective, too:

in arthritis and inflammatory conditions in horses, cattle and dogs

as supplemental therapy in shock and stress conditions

in nonspecific dermatoses in small animals

flexible dosages:

METICORTEN Aqueous Suspension, 10 mg./cc., 10 cc. vial, boxes of 1, 6 and 72.

METICORTEN Aqueous Suspension, 40 mg./cc., 5 cc. vial, boxes of 1, 6 and 72.

METICORTEN Tablets, 2.5 and 5 mg., bottles of 30 and 100.

1. Morris, R. G., and Hall, C. E.: A preliminary report on the use of Meticorten in Bovine Ketosis, J.A.V.M.A. *128*:132 (Feb. 1) 1956.

2. Siegrist, J. C.: Newer advances in corticoid therapy, Vet. Med. *51*:319 (July) 1956.

*T.M.

Schering

Faster relief from inflammatory reactions, infections, allergies and trauma

METIMYD Ointment

Veterinary with Neomycin

—the high-potency corticosteroid METICORTELONE + Sulfacetamide Sodium and Neomycin

OCULAR INFLAMMATION
EDEMA
ALLERGY
OTITIS EXTERNA
NONSPECIFIC DERMATOSES

— antibacterial spectra effective against most bacteria likely to be found topically

— sensitization to the topical use of either antibacterial agent extremely rare

METIMYD Ointment Veterinary: prednisolone acetate 0.5%, sulfacetamide sodium 10%, neomycin sulfate 0.25%, ⅛ oz. applicator tube, boxes of 1, 12 and 36.

METIMYD,* brand of prednisolone acetate and sulfacetamide sodium.

METICORTELONE,* brand of prednisolone.

Schering

*TM

A new therapeutic concept for diarrhea in calves and dogs

. . . Slows peristalsis
. . . Destroys enteric bacteria

antimotility

". . . diphemanil methylsulfate [acetylcholine blocking agent] utilizes a new concept in the treatment of diarrheas, that of inhibiting gastro-intestinal motility"[1]

antibacterial

". . . phthalylsulfacetamide is the sulfonamide of choice in the treatment of enteric infections in veterinary medicine"[2-4]

rapid-acting

". . . in calves, two 300-mg. boluses per day, from one to three days, was sufficient . . . to bring about an uneventful recovery"[1]

well tolerated

". . . produces no observable systemic side effects or sensitivity reactions"[1]

Indications

IN CALVES: calf scours

IN DOGS: uncomplicated diarrheas, persistent gastro-intestinal disturbances

Packaging:

LARGE ANIMALS — VARITON Compound Boluses, jar of 24 boluses; 6 jars, 24 boluses per jar

SMALL ANIMALS — VARITON Compound Tablets, bottle of 100

1. Christian, A.B.: Variton and Variton Compound in the treatment of bovine diarrhea. N. Am. Vet. 37:557 (July) 1956.

2. Rogoff, G.: Phthalylsulfacetamide (Thalamyd) in veterinary medicine. J.A.V.M.A. 117:220, 1950.

3. Williams, K.T.: Treatment of canine diarrhea. Vet. Rec. 66:283, 1954.

4. Christian, A.B.: Phthalylsulfacetamide as a treatment for infectious calf scours. J.A.V.M.A. 121:185, 1952.

VARITON® Compound, brand of diphemanil methylsulfate and phthalylsulfacetamide.

Schering

SCHERING CORPORATION, Bloomfield, New Jersey

MM-J-

induce
or
restore
normal
rumen function
with **ruminoc**

an excellent Calf Conditioner

Ruminoc Supplies live Rumen organisms, *plus* nutritional factors which cause the Rumen organisms to flourish, *plus* vitamins, nutrients for quick energy pick-up, tonic, and appetite stimulator. Has a palatable base, with added flavor — they like to eat it!

Mature Cattle: Corrects Rumen Dysfunction and stimulates rumination. Of value following milk fever, hardware disease, administration of sulfas per orum, and after ruminory operations.

Young Calves: Induces rumination, so that calf begins eating hay and grain sooner, grows faster, gains more economically. Normal rumen action prevents pot bellies.

Feeder Calves: Gets animals on roughage consumption sooner, reduces feed lot shrinkage. Excellent supportive treatment for coccidiosis.

Prices:
12—1-lb. pkgs...$ 16.20
25-lb. pail 30.00
100-lb. drum..... 110.00

A BALANCED FORMULA. *EACH POUND Contains:* 267 Billion Live Yeast and Rumen Organisms *plus* 255,000 USP units Vitamin A, 9,000 USP units Vitamin D, Gentian 100 gr., high energy Yeast Culture, Casein, Dextrose, Starch, Potassium Iodide, Urea, Dicalcium Phosphate, Sodium Bicarbonate, Sodium Chloride, Ferrous Sulfate, Manganese Sulfate, Magnesium Sulfate, Copper Sulfate, Zinc Sulfate, Cobalt Gluconate.

Directions: Mix in milk or feed, or administer by drench or stomach tube.

NLC

SERVING THE GRADUATE VETERINARIAN EXCLUSIVELY

THE
NATIONAL LABORATORIES
CORPORATION
KANSAS CITY

NOW! A COMPLETE LINE OF ETHICAL PET PRODUCTS

—Sold Only To Graduate Veterinarians

DIRO
PET PRODUCTS

FLEA & TICK BOMB

For dogs. Effective against insects resistant to Lindane, DDT, other chlorinated insecticides.

FLEA & TICK POWDER

For cats and dogs. Anti-static. Penetrates coat; allows powder to reach skin. Effective against insects resistant to Lindane, DDT, etc.

FLEA & TICK DIP

For dogs. Modified dip and shampoo. Effective against insects resistant to Lindane, DDT, other synthetic insecticides.

LANO-FOAM

For cats and dogs. All-weather dry bath contains lanolin and other essential oils to help prevent dryness of skin and coat.

DEODORANT BOMB

For Dogs. Bacteriostatic and fungistatic action attacks bacteria-produced odors; doesn't merely mask them. Refreshing fragrance.

More than three years in development by Whitmire—for over 25 years a leader in the manufacture of safe and dependable animal insecticide products.

The Diro line is offered specifically for dispensing only by Graduate Veterinarians. Like all other Whitmire products, those bearing the Diro label are made under the constant and careful supervision of a pharmaceutical chemist to assure the highest ethical standards.

Diro Pet Products can be bought with confidence—dispensed with confidence—used with confidence. Try them!

Ask Your Supplier For Literature
or write direct to Whitmire

WHITMIRE RESEARCH LABORATORIES, INC.
339 S. Vandeventer Ave., St. Louis 10, Mo.
wrl

The Bigness Of Little Differences

In few fields does the little difference loom so large as in the production of hog cholera vaccine. At Fort Dodge, no test, no precaution is spared to assure the effectiveness of M·L·V. Not only must U.S.D.A. requirements be met, but each serial must pass a series of extra tests to prove optimum purity, potency and safety.

In guarding livestock, the tiniest extra margin of protection is tremendous. Fort Dodge Laboratories, Inc., Fort Dodge, Iowa.

M·L·V *The Original*

TRADEMARK

FORT DODGE ... EVERLASTINGLY IN SEARCH OF THE SURER, THE SAFER

JOURNAL
of the American Veterinary Medical Association
Chicago 5, Illinois
Vol. 129 November 15, 1956 No. 10

The Opening and Closing Sessions of the Ninety-Third Annual Meeting Held in San Antonio, October 15-18

The Ninety-Third Annual meeting of the American Veterinary Medical Association convened in the Municipal Auditorium in San Antonio, Texas, on Oct. 15, 1956, Dr. Floyd Cross, president, presiding.

The convention was welcomed to San Antonio by City Manager Steve J. Matthews. Dr. Alvin Price, president of the Texas State Veterinary Medical Association, in responding to the welcome for the AVMA, said that the increase in population, with the resultant need for more food, creates a situation with which the veterinary profession must deal persistently and courageously; it must cease to temporize with such diseases as brucellosis, leptospirosis, and others which take their annual toll from the income of the livestock producer and reduces the animal food production, thereby creating hazards to the health of all of the people.

The following distinguished guests were introduced at the Opening Session by President Cross: Dr. J. A. Anderson, representing the British Veterinary Medical Association; Dr. R. J. Avery, Canada Department of Agriculture, Vancouver, B.C., representing the Canadian Veterinary Medical Association; and Dr. A. Alexander, president of the Veterinary College (Association) of Mexico. Dr. Fritz Nilsson-Sevelius of Sweden also attended the meeting.

Greetings from the Women's Auxiliary to the AVMA were presented by Acting President Mrs. A. E. Coombs, of Skowhegan, Maine.

After the presidential address by Dr. Cross, the awards and certificates of merit were presented (see the following pages for pictures and citations of award winners).

(Dr. C. M. Pomerat's address, which concluded the Opening Session, appears on pp. 458-462.)

The President's Address

FLOYD CROSS, D.V.M.
Fort Collins, Colorado

Our annual meeting should be a time of looking ahead to endeavors, projects, and plans built on or around our hopes for changes or improvements that will advance and elevate our profession.

This should also be an occasion for taking inventory, for looking back, and viewing our accomplishments and successes. If our achievements seem modest in retrospect, they at least represent something attempted, something done, and may merit some degree of satisfaction among ourselves.

Under projects accomplished, or in proc-

President Floyd Cross

ess, there are several that will be mentioned here:

INSURANCE COMMITTEE

1) There has been prepared, and clarified in detail, and submitted to the House of Representatives for their action, what we consider to be a good, sound insurance program for members of the profession. It is predominantly a group plan of health and accident insurance, designed to assist the members of the profession through periods of injury or sickness, when their income would cease or be sharply reduced. We consider this to be highly important, particularly to the young man starting his professional career. This insurance program must stand or fall on its merits. I do feel that the contribution made by the Special Committee on Insurance in developing this plan is an outstanding example of progress that can come only through organized effort.

CONSTITUTION BEING STUDIED

2) Another important matter that is receiving careful attention is the rewriting of our Constitution and Administrative Bylaws. Through the many years since their adoption, numerous changes and amendments make it difficult at times to know the actual meaning intended. A comprehensive, carefully studied revision should clarify many or all obscure points.

ELECTION OF PRESIDENT-ELECT

3) Consideration is being given toward devising a better and more representative method of electing the president of our Association. Under the present system, only those members who attend the annual meeting have a vote, and the very considerable number not present have no voice in the selection of the one to hold this important office.

It appears desirable that voting for president and other officers be done without regard to attendance at the annual meeting, but by means that will more accurately reflect the voice of all members.

VETERINARY SERVICE IN THE ARMED FORCES

4) During the past year, our Association was tested in its ability to respond to an emergency situation of considerable magnitude. I am referring to the action of the Secretary of Defense whereby he proposed

The Opening Session of the Ninety-Third

to abolish the veterinary services of the Army and Air Force.

The effective marshalling of constituent association secretaries, legislative contacts, appropriate committees, allied professions, and the membership at large in bringing their efforts to focus on this problem is an example of an Association activity for which we can be thankful and justifiably proud.

Without the facilities now available for immediate action, this cause would have been lost.

Today, the eventual outcome is not entirely clear; however, we can be assured that the final decisions will be based on facts rather than hearsay or inspired misinformation.

PUBLIC RELATIONS EXPANDED

5) I am very pleased to comment upon the subject of public relations and the important and far-reaching step in this field that our Association has taken.

As you may know, public relations is getting attention, with a full-time man working at our national headquarters. The man responsible for conducting this important work is well qualified and is receiving full support in all respects from the national officers.

We may expect that this aspect of our professional lives will receive a more concerted, better organized, more continuous attention than has been the case in the past. This is not to say that there have not been real efforts at establishing effective public relations in the past. Such attempts have been made, and they were adequately supported, but it seemed too often that most members of the profession were unaware of the efforts being made. Possibly the membership should have been given a greater opportunity for participation. Anyway, we have the proper organization now and we will keep our own and other learned professions and the general public informed concerning our professional attainments, the fields in which we serve, or should serve, and our important role in maintaining the human and animal health of the nation.

There is great need for enlightening the average person, and even some members of the professions, on the educational standards and abilities and skills of the modern veterinarian. This can be done effectively by our Public Relations Department

Annual Meeting of the AVMA in San Antonio

Dr. Alvin A. Price, president of the Texas Veterinary Medical Association.

Dr. A. R. Rees, Jr., general chairman of local arrangements.

through news stories in the press, through radio and television, and through the exchange of information and ideas with other professional societies, livestock associations, public health organizations, and other interested groups.

For far too long, our profession has been far too modest in letting the public know of its education, abilities, capabilities, attainments, and its rightful place in the medical service of our country.

During the past two years as president-elect and president, I have attended many veterinary meetings throughout the United States and Canada. All these meetings have been professional in character and those attending have been, in almost all instances, veterinarians.

Frankly, I have felt somewhat as though I were working with one hand tied behind my back due to the fact that I have had but one invitation as AVMA president to appear before nonveterinary groups. This was the Nebraska Livestock Growers Association. Other groups might well have been national meetings of cattle growers, cattle feeders, and those concerned with swine, sheep, and poultry, and many other organizations whose members could and should be interested in veterinary medicine.

It is stressed that we have a twofold task: first—the responsibility for keeping the membership informed and abreast of developments of the profession; second—to interest and inform nonveterinary groups concerning the services that we, as veterinarians, are capable of rendering and the extent of our training. We are thinking too little of this second important function, and have failed up to this time to recognize its importance fully.

RECOMMENDATIONS

Your retiring president and those who have advised him consider that there are certain important matters that should receive prompt attention by the Association, and these will be stated briefly:

AVMA-OWNED BUILDING

1) The ownership of our own building for the national headquarters of the Association, and the decision as to its location, should be the subject of careful study and investigation, possibly by a special committee which would render a report and recommendations at an annual meeting in the near future. At present and for some years past, we have spent considerable amounts for office rent, and we have nothing of a permanent nature as a result of this spending. Our own building, of proper size and in a good location, should provide the necessary office space for our national headquarters now and in an expanded future.

The decision as to the feasibility of this idea should be made after a committee has made a thorough study. This should include cost of land for a site and the construction of the building. There should also be a plan for financing the project. The AVMA is here to stay and it is time that we consider the matter of a permanent home.

NEED FOR ADDITIONAL FACTS

2) It is highly important that we know as far as possible what the future holds for the veterinary profession. No one, I am sure, can predict the future, but we can at least accumulate some data in the AVMA office that would serve as a foundation for predictions.

I am deeply concerned about what the professional future may hold, and it is my urgent recommendation that a broad, comprehensive, and detailed survey be made, by qualified personnel, of all phases of our professional life—present and future. There are so many questions to which we do not have satisfactory answers. In an emergency, we must substitute guesses for established facts or proved statistics.

This survey should establish many points and premises. For example, consider a veterinary body applying to state or federal government for funds with which to conduct research on some infectious disease. The questions would naturally be asked: "How important is this disease in the livestock economy of your state? What does it cost your livestock industry?" Could we answer with facts and approximate figures? I doubt it, and so must you. The same would be true of any similar technical question at this time. We do not have the answers that a comprehensive survey of the important livestock diseases should give us.

What of veterinary education of the future? Who can predict the curriculum necessary to meet the profession's needs in 1971, 15 years from now? Who knows whether we will be graduating enough veterinarians to meet the country's needs, or too few, or too many?

A recent study, entitled "Impending Tidal Wave of Students," indicates that if 40 per cent of those reaching college age do in fact attend college, then there will be nearly five and a half million students in the nation's institutions of higher learning in 1971, against 2.3 million in 1955.

How many of these students will want veterinary education? What will we do with them? What physical facilities will be required, what teaching and research staffs, what curriculum?

What are we to do in the teaching of poultry practice, poultry inspection, nutrition, artificial insemination, genetics, and public health and others? Will we take our rightful places in these important fields of veterinary endeavor, or will we leave them to those with a Ph.D. degree but no D.V.M. I fear that the trend at present is in that direction.

Should we plan our courses primarily for the general practitioner, or for the small animal expert, or the large animal specialist? Should we plan special instruction for the prospective career in government work, military veterinary career, or public health? Who knows at this time? I wish you would answer for me, for certainly I can not.

Would not a course in disease reporting and vital statistics be of great value to the profession? True, there are now some reported diseases required by various state regulations, but could we find anywhere the figures for the national rate of morbidity or mortality in shipping fever in cattle, for example?

We can readily picture a situation wherein a request was being made to Congress for funds to conduct research in animal diseases on a national scale. We would be asked, undoubtedly, the following questions: "How much research is being done now by the veterinary schools of the country, and on what problems? What are the facilities for research at the veterinary schools and how adequate are their physical plants, their staffs, and the state of staff training? What staff papers have been

Distinguished Guests

Dr. J. A. Anderson, Great Britain (left), Dr. A. Alexander, Mexico, and Dr. R. J. Avery, Canada, bring greetings from their associations.

Mrs. A. E. Coombs, Skowhegan, Maine, acting president of the Women's Auxiliary to the AVMA, and now president, delivering greetings at the Opening Session.

published? How are your institutions now financed for research?"

Could we answer these questions effectively? I think not.

Another important question at this time is the present and future place of the veterinarian in public health.

The veterinary profession is, or should be, actively concerned with public health.

Various fields of public health are now served by our profession, and meat inspection at the federal, state, or local level is most important. Particularly in the local situation, the practitioner can render a community service by doing an effective job of meat inspection. The same is true of dairy inspection.

In the town or county or district where a health unit is maintained, the local veterinarian should be a health department member, or he may be the health officer. In these capacities, he is not only a guardian of the health of man and animals in his area, but he is also keeping himself informed on conditions which will be important in his practice. Here too, he may enter the field of epidemiology, being of course actively concerned with the prevention, control, and elimination of epidemics in the human or animal population.

Poultry inspection is a new and growing field of action for the veterinarian, and may be conducted under federal, state, or local regulations.

Sanitation in food-processing plants is, of course, vastly important in the prevention of disease and elimination of food-poisoning epidemics, aside from the esthetic considerations. The veterinarian engaged in meat, dairy, or poultry inspection will naturally be the one most actively concerned with sanitation of establishments.

I have raised some pertinent and urgent questions, the answers to which must not be delayed, but, in view of our present knowledge or the lack of it, we do not have the answers.

The only means by which we may acquire the knowledge on which to base the answers is a complete and careful survey on a national scope, with this followed by the necessary research. We should explore the possibility of some one of the "foundations" which provide funds for such projects, taking over the financial backing of the survey which I propose. It has been done in similar situations.

GRADUATE STUDY AND CONTINUING EDUCATION

3) The matter of graduate study in the case of those who have received the D.V.M. degree deserves special consideration.

At present, only about 4 per cent of the members of our profession engage in teaching and research.

It is difficult, and at times almost impossible, to fill staff vacancies in these important fields with properly trained and well-qualified veterinarians. It is often a simple matter to find a nonveterinarian trained in the field of general science with a Ph.D. degree, who may possibly seem qualified to teach students of veterinary medicine, or to conduct research in the field of animal disease. This is becoming increasingly common in such sciences as parasitology, bacteriology, virology, and physiology. No doubt there others.

The question resolves itself into an act of simple choice: Do we feel, and are we willing to concede, that veterinary students in certain areas of study can receive from well-trained, nonveterinary instructors the high quality of teaching which we require? Do we also consider that research in certain fields of animal physiology and pathology can be done effectively by individuals who are without a complete and thorough training in the medical field?

If your answers to these questions are in the negative, then you must devise some way to direct veterinarians who have the academic urge into the field of graduate study.

In order to bring about the necessary level of higher education, and to encourage graduate study, it seems imperative that schools of veterinary medicine strengthen and expand their present graduate programs and facilities.

RESEARCH FUND AND FELLOWSHIPS

Fellowships, graduate assistant positions, and other means of providing financial aid for the interested and qualified student for advanced degrees must be provided to a greater extent.

The AVMA, through the Research Council, is at present granting as many fellowships as their limited funds will permit. The money available in the research fund depends largely upon the yearly

contributions of individual members of the profession. It is essential that some other and more certain means be found by which to maintain and increase the funds necessary for this highly important and desirable enterprise.

A strenuous effort should be made to encourage support of the research fund by private enterprise, such as livestock organizations, meat-packing establishments, drug and biological products companies, and others. If these sources do not provide enough funds, then serious consideration must be given to increasing the dues and fees of the membership in sufficient amount to maintain research and continuing education at the proper level.

Aside from teaching and research, there is need for advanced study in other phases of veterinary medicine.

Among these are surgery, pathology, bacteriology, physiology, virology, poultry diseases, and public health. Those interested or who propose to enter these fields should be afforded the opportunity for graduate study and application in practical experience.

CONCLUSION

It has been my privilege to attend many association meetings in the United States and Canada, and I am grateful indeed for the kindness and courtesy that was always shown me, and which make these visits pleasant memories.

The members of the AVMA staff, the secretary and assistant secretary, were always most helpful, and I am sincerely thankful for their efforts, and in this I am glad to include the editorial staff of the JOURNAL.

The good work done by all the committees and members of the House of Representatives is acknowledged with grateful thanks. Their activities contribute much to the success of the AVMA and the profession as a whole.

General J. A. McCallam has done superior work, as liaison officer in Washington, in maintaining the position and desires of the AVMA before Congressional committees. He has been particularly active and successful in promoting legislation favor-

The chuck wagon supper, held on Tuesday evening, October 16, in the San Antonio Coliseum, was the "president's night."
The inset at lower right shows President Cross (left), Mr. Bert Hill, secretary of the American Veterinary Exhibitors' Association, and President-Elect Wayne O. Kester ready to award the door prizes of the Exhibitors' Association.
The white horse and the young woman provided entertainment for over 1,600 who attended.

able to the military veterinary services, and he now has a more critical problem to face and solve. He merits our sincere appreciation and active help whenever he asks for it on matters affecting the profession.

Last and most important of the organizations we have the privilege of thanking is the Women's Auxiliary.

This organization, by reason of its spirit, and activity, and its constant thought for the welfare of the AVMA is a prominent factor in promoting morale and increasing attendance at the meetings. The presence of its members adds a gracious touch to meetings that might otherwise become drab and submerged in profundity.

Upon this occasion, which marks the end of my tour of duty as your president, I am very much aware of the debt I owe to so many for the help, and support, and inspiration that have been given me. The president could accomplish very little were it not for the never-failing assistance he receives from those in strategic places and, indeed, from all the membership.

Presentation of Awards

Humane Act Award—Glen T. Allen

This year's committee unanimously agreed upon all the selections. The winner is Glen T. Allen, 15 years old, son of Mr. and Mrs. William Allen of 3565 N.W. 36th St., Miami, Fla.

Glen T. Allen (top), Miami Fla., winner of the Humane Act Award. Below is shown Dr. W. A. Young, chairman of the Humane Act Award Committee, presenting the award to Dr. Jack Knowles of Florida, who will in turn present it to Glen at a local veterinary medical meeting.

Glen is an Eagle Scout and has been active in Boy Scout work for several years. His great and special interest in animals dealt with the Florida Key deer. This boy spearheaded the drive to afford protection and establish a refuge for these interesting little members of the deer family, which are found only in a special section of Florida.

In 1951, the herd had been reduced by hunting and other means to a mere 30 animals. Through the efforts of Glen and others who joined him, the herd has been built up to well over 100. This young lad's efforts reached out to all parts of the nation, touching zoological societies, Congress, two presidents of the United States, state and national conservation officials, the Secretary of the Interior, and others. The result has been that Congress established the National Key Deer Refuge on 71 acres of land as a start to guarantee the natural habitat for the perpetuation of this unique wild creature, the Florida Key deer.

Numerous honors and awards have been bestowed upon Glen by other organizations, and it is with a great deal of satisfaction that your committee votes to award the 1956 Humane Act Award of the AVMA to this highly deserving young man, Glen T. Allen.

The award consists of a suitable certificate and a $100 face value series E savings bond.

Secondary awards were made to six boys and girls: Sharon Harmon and Lois Lee, of Espy, Pa., for their efforts in behalf of a cat caught in a steel trap; John Sutter, Boy Scout from Mastic Beach, N. Y., for heroic efforts in behalf of animals endangered by a forest fire; Dorothy Garrett, of Phillips, Texas, for unusual care and attention to a mocking bird; Denise Antoni, of Brockville, Ont., for rescuing a dog from a ravine; Scout Troop 13, of Olean, N. Y., for their united efforts in cleaning up the Olean S.P.A.C. shelter after a disastrous flood; and Nancy Ellen Wright of Clarksburg, Md., for efforts in behalf of an unfortunate pig, which started her in the business of raising lambs and caring and providing special care to numerous other animals.

Citation—Practitioner Research Award to Dr. Wayne H. Riser

Dr. Wayne H. Riser is a native of, and received his primary and secondary education in, Earlham, Iowa; his D.V.M. from Iowa State College in 1932; and an M.S. from the same college in 1945.

He was in general practice at Glenwood, Iowa (1932-1937), then in small animal practice in Des Moines (1937-1946), and later (1949) established the Riser Animal Hospital at Skokie, Ill.

Dr. Wayne H. Riser, Skokie, Ill. (right), accepting the Practitioner Research Award from Dr. C. A. Brandly, chairman of the Research Council.

In 1945-1946 he assisted in the Clinical Pathology Department of the Iowa Methodist Hospital, Des Moines, Iowa, and since 1950 he has been lecturer in the Department of Pathology, Northwestern University Medical School, Evanston, Ill. From 1945 to 1949 he was engaged in editorial and research work.

In addition to innumerable consultancies, board memberships, and officerships in professional and scientific societies and associations, Dr. Riser has presented many papers to veterinary and other groups. He has been author or co-author of approximately 35 research and professional papers and publications.

It is in recognition of Dr. Riser's abiding interest in, and contributions from, his research efforts as a practitioner, "beyond the call of duty" and for the welfare of man's animal friends, that he has been selected to receive this, the first AVMA Research Council Award for Research by a Practitioner.

In acknowledging, in behalf of the Research Council and the AVMA, Dr. Riser's singular accomplishments in both the art and science of veterinary medicine and the challenge toward productive achievement which they represent to others of our profession, present and future, the following words by Robert Oppenheimer are particularly appropriate:

> Both the man of science and the man of art live always at the edge of mystery, surrounded by it; both always, as the measure of their creation, have had to do with the harmonization of what is new with what is familiar, with the balance between novelty and synthesis, with the struggle to make partial order in total chaos. They can, in their work and in their lives, help themselves, help one another and help all men.

• • •

Citation—Twelfth International Veterinary Congress Prize to Dr. Hadleigh Marsh

Born Nov. 21, 1888 at Ripon, Wis., Dr. Hadleigh Marsh received his early education in local schools and then enrolled at the University of Chicago where he received the B. S. degree (*cum laude*) in 1909. In 1912, he received his D.V.M. degree (with distinction) from George Washington University. In 1908, and while studying veterinary medicine, he was an assistant in poisonous plant investigations in the Bureau of Animal Industry, U.S.D.A.

From 1913 to 1917, he was a veterinary inspector with the BAI. In 1917 and 1918, he served with the Veterinary Corps, U. S. Army, a part of which time he was an officer in charge of the veterinary laboratory at Fort Sam Houston. He was discharged with the rank of captain, was a major in the Veterinary Reserve Corps from 1920 to 1940, and was also a major in the Montana National Guard from 1923 to 1929.

Dr. Marsh was bacteriologist-pathologist of the Montana Livestock Sanitary Board from 1919 to 1929, and then organized and headed the Montana Veterinary Research Laboratory at the Agricultural Experiment Station, Bozeman, from 1929 to 1950. At this time, he voluntarily retired as head to devote his time to research and writing. Presently, he is on leave from the Laboratory and is serving as state veterinarian.

He has traveled, and studied sheep diseases and management, in New Zealand under grants from the Montana and the National Wool Growers' Associations. He is a leading authority on diseases of sheep.

In 1955, Dr. Marsh was presented a centennial

Dr. Marsh (right) accepts the Twelfth International Veterinary Congress Prize from President Cross at the meeting in San Antonio.

award by Michigan State University in recognition of work as "scientist, conservationist, humanitarian, and eminent ovine pathologist."

He is the author or co-author of over 80 papers and reports on various technical subjects related to animal diseases, particularly in the field of poisonous range plants, sheep diseases, bovine tuberculosis, vibrionic abortion, and glanders.

In professional and scientific circles, Dr. Marsh has been a member and active worker in the AVMA (joined 1912), the U. S. Livestock Sanitary Association, Intermountain V.M.A., Montana V.M.A. (president in 1941 and secretary-treasurer, 1922-1938), charter member and past president of the Conference of Research Workers in Animal Diseases, charter member of the American Society of Veterinary Pathologists, and a member of the Committee on Animal Diseases of the Agricultural Board, National Research Council.

In civic affairs, Dr. Marsh has been active in young peoples' programs, Boy Scout work, junior recreation camps, community chest drives; also the Montana State Fair, and other livestock exhibitions. He is active in church work and the American Legion.

• • •

Citation—Borden Award and Medal to Dr. Herbert L. Gilman

Herbert L. Gilman was born on Oct. 26, 1895, at Woodbury, N. Y. He graduated from elementary school in 1909 and from Richmond Hill High School in 1913. He then entered the New York State Veterinary College, Cornell University, Ithaca, N. Y., where he was awarded the D.V.M. degree in 1917, an M.S. in 1920, and a PhD. in 1922. While a student in veterinary college, he successively served as appointed student assistant in anatomy, student assistant in physiology, and as an officer in the U. S. Army Veterinary Corps for 18 months. Following the war, he returned to Cornell and took his graduate training under Drs. W. L. Williams, B. F. Kingsbury, R. R. Birch, and V. A. Moore. In 1919, Dr. Gilman was appointed instructor in diseases of the genital organs of cattle under Dr. Williams. In 1920, following award of the Ph.D. degree, he was appointed assistant professor of Veterinary Research. From 1938 to date, he has been professor of Veterinary Bacteriology.

Dr. Gilman (right) receives the Borden Award from Mr. John H. McCain of the Borden Company Foundation.

He is a member of Sigma Xi, Phi Zeta, Southern Tier Veterinary Medical Association (past president), New York State Veterinary Medical Association, the AVMA (past chairman of the Section on Research and member for a long term of years), and is a past master of Hobasco Lodge 716 F. and A. M.

Most of his professional life has been devoted to research on diseases of dairy cattle, with some teaching. Major fields of endeavor have been diseases of the genital organs of dairy cattle, brucellosis, trichomoniasis, and bovine vibriosis. In collaboration with Dr. R. R. Birch, Dr. Gilman participated in fundamental research on brucellosis, helping to lay the ground work for our present-day understanding of this disease.

• • •

Citation—AVMA Award to Col. Robert J. Foster (Ret.)

Born in Youngstown, Ohio, Sept. 7, 1880, Colonel Foster received his early education in Ithaca, N. Y., where his parents moved three years after his birth. In 1902, he received the D.V.M. degree from New York State Veterinary College at Cornell University.

After graduation, he served one year as assistant state veterinarian of South Carolina and veterinary science instructor at Clemson Agricultural College. The next year, he was an instructor at the University of Missouri and then spent a year at Kansas State College in similar work. He then decided on military veterinary medicine as a career.

From 1905 to 1916, Colonel Foster served as veterinarian with the 12th U.S. Cavalry at various posts and was stationed along the Mexican border during the Pancho Villa insurrection. In 1916, he was transferred to the 9th U. S. Cavalry for duty in the Philippines. In June of that year, when the Army Veterinary Corps was organized, he was commissioned first lieutenant and returned to the States to organize and command the veterinary section of the Medical Officers Training Camp at Fort Riley, Kan., with the rank of major in the Veterinary Corps, National Army.

In 1918, Colonel Foster was ordered to duty in the Surgeon General's Office in Washington, D.C. and, later, was placed in charge of reorganizing the Veterinary Corps under the National Defense Act of 1920, which established the present Army Veterinary Corps.

From November, 1920, until June, 1952, he served as chief veterinarian, Army of Occupation, at Coblenz, Germany. The next four years were spent at the Cavalry School, Fort Riley, as station veterinarian in charge of veterinary instruction. He did much to revise the course in horsemanship, renovate the veterinary hospital, and improve the care of horses, all of which was done with his customary "zeal, energy, and spirit of cooperation" noted by one of his superior officers.

Colonel Foster (right) accepting the 1956 AVMA Award from President Cross at the San Antonio Meeting.

From July, 1926, to September, 1929, Colonel Foster was department veterinarian, Panama Canal Zone, and then until June, 1931, was Corps area veterinarian, Seventh Corps Area, Omaha, Neb. His next assignment was at Fort Bliss, Texas.

Upon his recommendation, a meat-food inspection service was established, in 1935, for the Civilian Conservation Corps to which Veterinary Corps officers were assigned, a considerable number so serving in various parts of the country.

In May, 1934, Colonel Foster was called to Washington to serve as director of the Veterinary Corps in the Surgeon General's Office; this tour of duty was completed in April, 1938. It was during this time that he effectively opposed a War Department proposal to drastically reduce the officer and enlisted personnel of the Veterinary Corps.

Colonel Foster joined the AVMA in 1906. He served the Association in various capacities and was elected president in 1936. His term as president was marked by a notable increase in membership; his recommendations at the annual meeting in 1937 brought about reorganization of the Association's activities, administration, and program. All told, he did much to further the prestige and progress of the AVMA and the veterinary profession in general.

Since retiring from military life in 19??, Colonel and Mrs. Foster have made their home in San Francisco where, with characteristic zeal and energy, he has made his services available to the state association and where he was honored, in 1953, for his efforts in promoting greater recognition of the veterinary profession.

• • •

Certificates of Appreciation

(Two years ago, the Association authorized expressions of appreciation to selected persons in lay life who make significant contributions to the public understanding of the veterinary profession. This award has been presented only once previously.

This year, two individuals have been nominated and selected by the Committee on Awards to receive the Association's Certificate of Appreciation.)

Citation—Mr. Charles S. Travers

For ten years Mr. Travers has served as executive secretary of the California State Veterinary Medical Association—the first to hold that title since it was established as a full-time office in 1947. Since then, the membership of the California Association has increased more than four times, its influence and affluence have been greatly expanded, and its liaison with groups related to veterinary medicine has been vastly improved.

Through Mr. Travers' efforts and the cooperation of those for whom he works, he has demonstrated the value of cooperation with livestock and other agricultural groups by veterinary medical associations. His untiring energy and readiness

Mr. Harry Miller (left), of New York City, and Mr. Charles S. Travers (right), of San Francisco, with the awards presented by President Floyd Cross.

to devote himself to the problems of the moment, or of the future, for the benefit of veterinarians in California is an inspiring example. He has been equally responsive when called upon by the AVMA in legislative and other matters.

Having observed his work at firsthand, I am especially pleased on behalf of the Committee on Awards to present this certificate as a token of our esteem — in recognition of outstanding contributions to better public understanding of the work of the veterinary profession.

Citation—Mr. Harry Miller

Mr. Miller's position as director of the Gaines Dog Research Center, and his interest in, and promotion of, activities related to dogs and their well-being, have made him well known to the veterinary medical profession. He and his organization have directed attention to important aspects of canine nutrition and health and these efforts have had significant results.

Moreover, his sincere interest and beliefs have brought him many friends in our profession. He has contributed to public understanding of the work of veterinarians in several ways, including the "Veterinarian of the Year" Award made annually by him and his organization. In addition, the motion picture films, veterinary symposiums, and research publications which he has sponsored are substantial evidence of his real interest in and devotion to dogs, and the part which veterinarians and veterinary science play in safeguarding their health.

It is a privilege to present him this token of our esteem, the Certificate of Appreciation of the AVMA in recognition of his contributions to better public understanding of the work of the veterinary profession.

Tissue Culture in Experimental Biology and Medicine

C. M. POMERAT, Ph.D.

Galveston, Texas

IN HIS PRESIDENTIAL address, Dr. Floyd Cross pointed out some of the difficulties in alerting the general public to the importance of veterinary medicine. As he spoke, I was reminded of Mark Twain's famous questions and answers which ran something like this: "What is the most wonderful product of creation?" Answer: "Man."

Dr. C. M. Pomerat delivering his address at the Opening Session in San Antonio.

"Who discovered this extraordinary fact?" Answer: "Man." The problem of dealing with our anthropomorphic thinking is always with us!

The remarkably complete index to the literature of tissue culture by Murray and Kopech,[1] covering the period from 1884-1950, is cross-indexed to include listings by animal species. The majority of approximately 15,000 articles deal with avian and rodent tissues.

Currently, with the vast increase in the use of methods for cell culture with the aid of antibiotics in handling contaminated tissues, human test objects have gained in popularity. Man is becoming a serious rival of rats and mice for tissue culture investigations—offering us another example of anthropocentric attitudes! Indeed, man is such a good experimental animal that I now meet the onslaught of objections by ardent antivivisectionists with the remark, "I agree with you perfectly, let's not use pussy cats; let's use human beings, particularly children, for experimental work." Of course, I go on to explain that investigators in medical centers have an unlimited supply of material available from surgical specimens, biopsies, and even autopsies. The tonsillar tissue discarded from one child can provide approximately 1,000 explants for culture. Prepucial tissue serves as an important source of epithelial and connective tissue elements.

In casting about for an illustration of some study having general significance in both human and veterinary medicine, it occurred to me that you might be interested in our investigations on wound healing. Our studies involve cultivating fragments approximately 2 mm. square from the tis-

From the Tissue Culture Laboratory, Department of Anatomy, Medical Branch, University of Texas, Galveston.

Presented, in part, at the Opening Session, Ninety-Third Annual Meeting of the AVMA, San Antonio, Texas, Oct. 15-18, 1956.

sue of wounds at various stages of repair in Rose chambers[2] (fig. 1).

Granulating tissue at the suppurative stage is characterized *in vitro* by the emigration of enormous numbers of mobile cells which consist initially of a predominance of neutrophils. Within three to four days, this population is reduced primarily to lymphocytes, monocytes, and macroph-

Fig. 1—This Rose chamber is a "sandwich" construction consisting of a pure gum rubber gasket with a hole in its center, flanked on either side by 43- by 50-mm. cover glasses of No. 1 thinness. The system is made airtight by screwing stainless steel plates on the outer faces with an Allen wrench. Fluid nutrient can be exchanged via 25-gauge needles inserted through the rubber gasket.

ages.* The connective tissue phase now is announced by the emigration of spindle cells from the explants. These produce long strands and feltworks which can be shown to involve rich formations of reticular and collagenous fibers by the end of the second week. It is suspected that some anastomosing systems of elongated cells represent endothelium.

Characteristic phases of the reparative process as we see it in tissue cultures are shown (fig. 2-5). It is not the purpose of this report to develop a systematic review of wound healing, but rather to point up the numberless challenging opportunities for research on the problem of surgical repair. Methods are available to show how cells deal with bacteria, execute their duties in the microdebridement of damaged areas, and the chemical factors involved when mesodermal elements prepare the bed to receive epithelial associates.

As an illustration of a project with what we believe might have a very important future in veterinary medicine, here are a few pictures of the *in vitro* behavior of exfoliated cells from the mammary glands of bitches.†

With characteristic vision, Dr. Dudley Jackson, an eminent San Antonio veterinarian and cancer specialist, in some studies which we had done several years ago, saw an opportunity to follow the cellular evolution of papillomatous clusters from the intraductal area of mammary tissue. Since the dog exhibits a wide spectrum of pathological changes in this area, this animal became our primary experimental object. Typical source material and the outgrowth of epithelial clusters of explants obtained from the mammary secretion of dogs are shown (fig. 6-9). This attack has been described in papers by Pomerat[3] and by McCormick, Jackson, and Pomerat.[4] Again, a comprehensive report on exfoliative cytology is beyond the scope of this address. Work in progress here in San Antonio by Drs. D. Jackson, T. Sergeant, F. W. Steinberg, and D. Todd is now being directed at exploring the dynamic cytology of exfoliated cells from the cow's udder.

Current developments in the tissue culture field have much to offer the experimentalist in the veterinary field. As the result of a long series of arduous researches, Parker and his associates[5] have evolved a synthetic medium for the animal cell. Earle's group[6] at the National Cancer Institute analyzed the constituents of an ideal fluid nutrient and from this have prepared a list of essential constituents to serve as a complete cell diet. While not completely defined chemically, the formulas presented by Waymouth[7] and by Eagle[8] are more easily prepared.

All of these efforts point to an era of a more scientific approach to the analysis of cellular metabolism under conditions permitting a high degree of control. It will become possible to determine the precise nutritional requirements for the growth of various species of normal and pathological tissues.

Much interest has centered on the development of cell strains which are managed

*A 350-ft., 16-mm., silent motion picture was presented at this point.

†A second film was presented at this time.

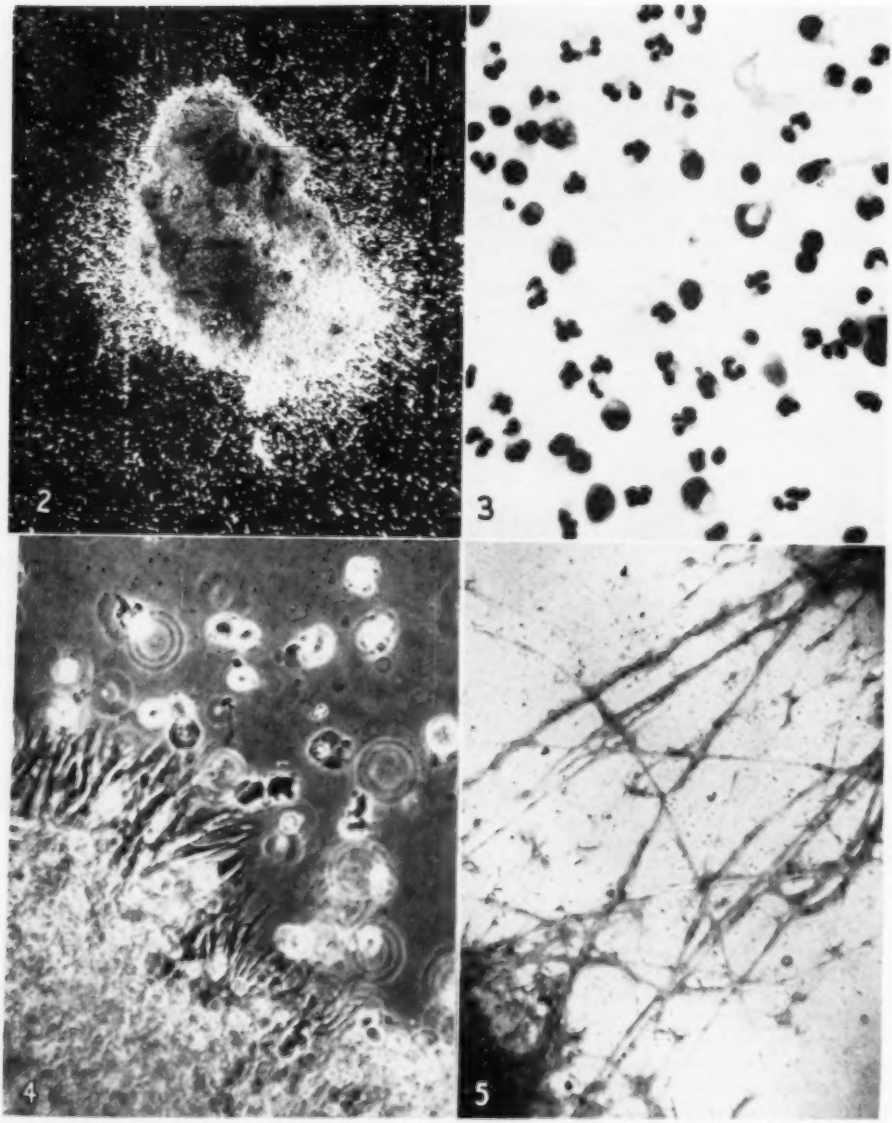


Fig. 2—Granulating tissue from a suppurative wound of a patient with a third-degree burn, after one day of culture in a Rose chamber. The large number of emigrating cells were predominantly neutrophils. x 24.

Fig. 3—The same tissue shown in figure 2 but after two days in culture. The preparation was stained with Giemsa and May-Grünwald stains. Note the predominance of polymorphonuclear cells with occasional lymphocytes, monocytes, and macrophages. x 600.

Fig. 4—Human granulating tissue. Living cells as seen in a one-day culture with phase contrast optics. Spindle cells, presumably fibroblasts, are seen in an early phase of emigration from the explanted tissue fragment. x 367.

Fig. 5—Human granulating tissue after six weeks in culture, showing a network of connective tissue elements between two fragments. Such "feltworks" with associated acellular fibrillar deposits are believed to represent a framework which is formed for the reception of an epithelial cover. Giemsa-May-Grünwald stain. x 30.

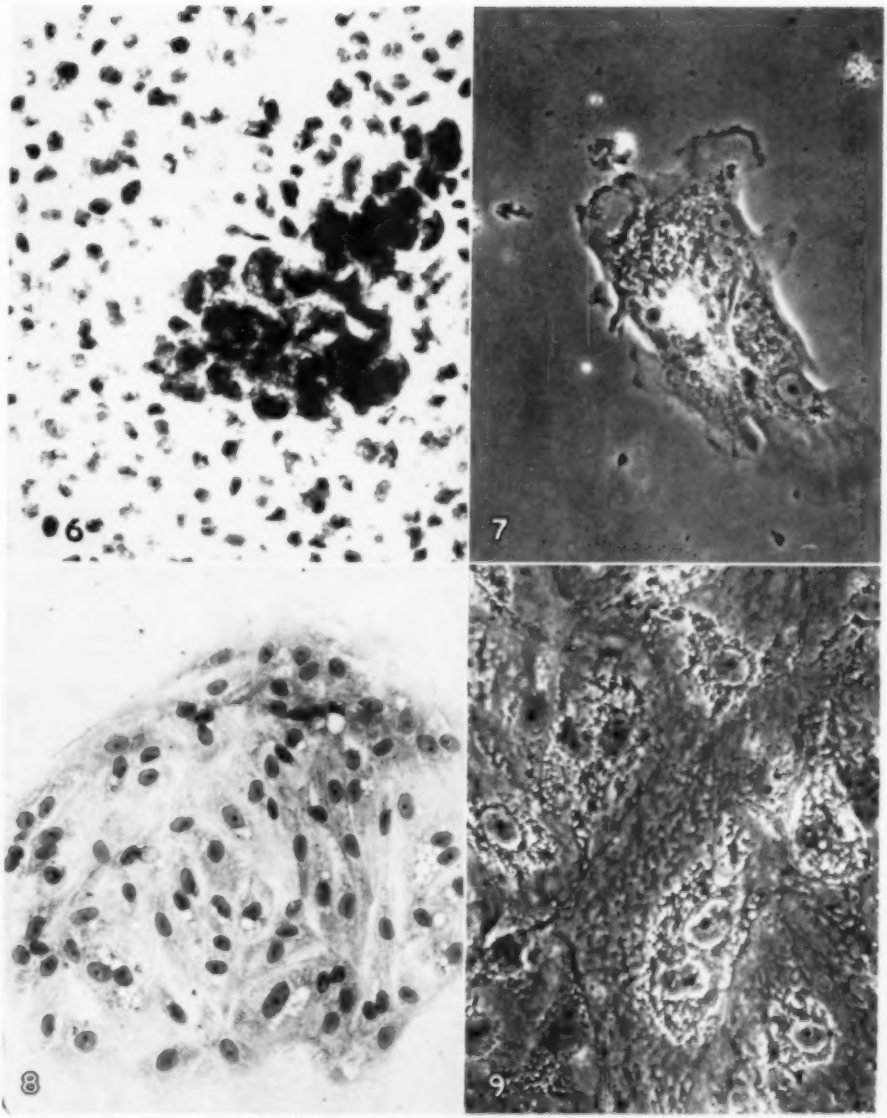


Fig. 6—Direct smear of a papillomatous cluster and leukocytes from the mammary secretion of an old bitch. Stained with Giemsa-May-Grünwald. x 500.

Fig. 7—A small group of epithelial cells in a 48-hour-old culture of a papillomatous cluster similar to the one shown in figure 6. Living preparation; phase contrast optics. x 400.

Fig. 8—Epithelial island similar to that shown in figure 7 but after four days in culture and following staining with Giemsa and May-Grünwald. x 210.

Fig. 9—Central portion of a large island of epithelial cells after nine days in vitro. Source material similar to that shown in figure 6. x 400.

somewhat like culture lines of microbes. Thus, the HeLa cell, which was derived from a human carcinoma of the cervix by Dr. George Gey at the Johns Hopkins Hospital, is routinely used in scores of laboratories in various parts of the world for cytological, virological, and chemotherapeutic investigations. The rapidly growing list of available cell strains led the Tissue Culture Association to appoint Dr. Joseph Leighton of the University of Pittsburgh School of Medicine to head a committee dealing with this subject. Derivatives of individual cells which provide clone strains give promise of opening a new field of mammalian cytogenetics which will parallel the brilliant work which has been done with bacteria and with Neurospora.

It has become essential in the conduct of a major program in microbiology to include a tissue culture section. What has been done with the Salk vaccine is only the beginning of the realization of what can be accomplished. The veterinarian may offer important aid in overcoming problems requiring the use of kidneys from imported monkeys for the polio vaccine, and in the quest of the most appropriate cells needed for the harvesting of other viral species.

In several medical schools, tissue culture laboratories have been developed which serve several research interests besides the area of microbiology. These are rapidly demonstrating the appropriateness of having a variety of living cells readily available for experimental purposes as a constellar system in the orbit of a biological teaching and research program.

It is most satisfying to see several papers on our program which involve the use of cell culture methods as an aid in the solution of animal disease problems. It is to be hoped that veterinary schools will see fit to encourage nuclei for this type of promising cell research.

References

[1]Murray, M. R., and Kopech, G.: A Bibliography of the Research in Tissue Culture. Academic Press, New York, 1953.

[2]Rose, G.: A Separable and Multipurpose Tissue Culture Chamber. Texas Rep. Biol. and Med., *12*, (1954): 1074-1083.

[3]Pomerat, C. M.: Motion Picture Studies of Living Papilloma of the Breast and Breast Cancer. Texas Rep. Biol. and Med., *10*, (1952): 217-227.

[4]McCormick, W. C., Jackson, D., and Pomerat, C. M.: Observations on the Behavior of Exfoliated Cells from Breast of Dogs in Tissue Culture. Texas Rep. Biol. and Med., *11*, (1953): 257-273.

[5]Healy, G. M., Fisher, D. C., and Parker, R. C.: Nutrition of Animal Cells in Tissue Culture. X. Synthetic Medium. Proc. Soc. Exptl. Biol. and Med., *89*, (1955): 71-77.

[6]Evans, V. J., Bryant, J. C., Fioramonti, M. C., McQuilkin, W. T., Sanford, K. K., and Earle, W. R.: Studies of Nutrient Media for Tissue Cells *in Vitro*. I. A Protein-Free Chemically Defined Medium for Cultivation of Strain L Cells. Cancer Res., *16*, (1956): 77-86.

[7]Waymouth, C.: A Serum-Free Nutrient Solution Sustaining Rapid and Continuous Proliferation of Strain L (Earle) Mouse Cells. J. Nat. Cancer Inst., *17*, (1956): 315-327.

[8]Eagle, H.: The Salt Requirements of Mammalian Cells in Tissue Culture. Arch. Biochem. and Biophys., *61*, (1956): 356-366.

• • •

Closing Session of the Ninety-Third Annual Meeting

Awarding of President's Service Scroll and Installation of New Officers

Retiring President Floyd Cross (right) receives the Service Scroll from Dr. J. M. Arburua, chairman of the Executive Board.

Dr. W. W. Armistead (right), dean of the School of Veterinary Medicine, Texas A. and M. College, was installed as president-elect by Retiring President Floyd Cross.

General Wayne O. Kester (right) was installed as president of the AVMA by Dr. J. M. Arburua, chairman of the Executive Board.

The vice-presidents elected at San Antonio are (left to right):
Dr. K. M. Curts, Kansas City, Kan. (zone 1); Dr. Mark W. Allam, Media, Pa. (zone 2); Dr. Kenneth Whittington, Memphis, Tenn. (zone 3); Dr. Martin D. Baum, Denver, Colo. (at large).
Dr. C. U. Duckworth, Berkeley, Calif. (zone 4) was not present when the picture was taken.

The officers of the Women's Auxiliary to the AVMA, elected at their annual meeting in San Antonio on October 16, are (left to right)—Mrs. A. E. Coombs, Skowhegan, Maine, president; Mrs. L. H. Moe, Stillwater, Okla., president-elect; Mrs. E. A. Woelffer (not present), Oconomowoc, Wis., first vice-president; Mrs. E. E. Leasure, Manhattan, Kan., second vice-president; Mrs. James Cornwell, Asheville, N. Car., third vice-president; Mrs. Frank Booth, Elkhart, Ind., secretary; Mrs. C. M. Rodgers, Blandinsville, Ill., membership secretary; Mrs. J. D. Stevens, Sequim, Wash., treasurer; and Mrs. Tom Maddox, Greenville, Ky., recorder.

Dr. Armistead Chosen President-Elect in San Antonio

The dean of the School of Veterinary Medicine, Texas A. & M. College, Dr. W. W. Armistead, was elected to the office of president-elect of the AVMA at the Ninety-Third Annual Meeting in San Antonio on October 16. He succeeds Brig. Gen. W. O. Kester who was installed as president.

President-Elect W. W. Armistead

Dr. Armistead was born on Oct. 20, 1916, in Detroit, Mich. Soon after, his family moved to Columbus, Ohio, where he attended the public schools. He completed his public school education in Houston, Texas. In 1938, he received his D.V.M. from Texas A. & M. College; in 1950, his M.Sc. from the Ohio State University; and in 1955, his Ph.D. from the University of Minnesota.

Upon graduating from Texas A. & M. College in 1938, he entered general practice. In September of 1940 he joined the clinical staff of the School of Veterinary Medicine of his alma mater and remained in that position until he entered the Veterinary Corps, U.S. Army, in 1942. He served at Fort Sill and Fort Reno, Oklahoma, and in North Africa and Italy.

In 1946, Dr. Armistead became clinician and professor at the School of Veterinary Medicine, Texas A. & M. College, and served in this capacity until he was appointed dean in 1953.

The author of over 40 scientific articles, mostly on practical subjects relating to small animal veterinary medicine and surgery, he is also a contributing author to "Questions and Answers," "Canine Surgery," and "Canine Medicine," all published by American Veterinary Publications, Evanston, Ill., in 1951, 1952, and 1953, respectively. He is a consulting editor of the *North American Veterinarian*.

Dr. Armistead joined the AVMA in 1944; he is also a member of the Texas Veterinary Medical Association, the Texas Public Health Association, the New York Academy of Science, the Conference of Public Health Veterinarians, and the Animal Disease Research Workers in the Southern States. He served as president of his state association in 1947-1948. He is a member of the veterinary fraternities Phi Zeta, Sigma Xi (research), Phi Kappa Phi, Phi Eta Sigma, and Omega Tau Sigma. Dr. and Mrs. Armistead have two sons, 13 and 16, and a daughter 11 years old.

The AVMA-sponsored luncheon for delegates of student chapters and their auxiliaries to the convention was held on Tuesday, October 16, in the Hilton Plaza Hotel.
Dr. H. E. Kingman, Jr. (standing, right), assistant executive secretary of the AVMA, presided.

Views of the Commercial Exhibit Space in the Auditorium in San Antonio

Observations on Mucosal Disease of Cattle

CARL OLSON, Jr., D.V.M., Ph.D., and ALVIN B. HOERLEIN, D.V.M., Ph.D.

Lincoln, Nebraska

MUCOSAL DISEASE as described in Iowa, in 1953,[1] has been reported in many parts of the United States and Canada. Its etiology and pathogenesis is still obscure despite numerous attempts at experimental transmission. Some reports[1-3] indicate only a mild reaction in animals receiving material from natural cases of the disease. Leukopenia and symptoms of the disease were reported[4] in 7 animals that received whole blood from cattle with field cases of mucosal disease. In 1 animal, the experimental disease was fatal 37 days after exposure. Little is known of how the disease is spread, but the number of animals affected in herds is usually low and varies up to 20 per cent. The features of low morbidity, high mortality, and difficulty of experimental transmission have served to differentiate mucosal disease from virus diarrhea,[4,5] although the pathological differences between these diseases appear to be quantitative rather than qualitative.

This report concerns observations on epizootics of mucosal disease in two herds of cattle in central Nebraska (about 100 mi. apart). In one instance, circumstances led the owner to add a number of presumably susceptible animals to the herd during the early part of the herd epizootic. These newly introduced calves failed to develop the disease.

HISTORY OF HERD A

There were 180 Hereford calves in the affected group born in the spring of 1953. The calves were on a good wintering ration of 40 per cent protein cottonseed cake and second-cutting hay which consisted of a mixture of timothy, wild hay, and clover. The epizootic of mucosal disease in the herd began the latter part of January, 1954. During the first six weeks, 19 calves died. The disease continued for five months and a total of 53 calves were visibly affected, 43 of which died.

The initial symptom was uneasiness with the calves restlessly lying down and getting up. A profuse diarrhea developed early with considerable mucus and blood clots in the feces. There was a thick tenacious nasal discharge and slobbering. The inner surface of the lips and gums was inflamed and there were erosions and ulcers of the oral mucous membrane. Some of the calves coughed and in some there was lacrimation. Temperatures were variable but generally within normal range. One calf had a temperature of 105 F. and the next day only 102 F.

The affected calves were given therapeutic doses of various antibiotics without success. In the early part of the epizootic, death occurred after a short (less than 7 days) course of the disease. Later, many of the calves lived for several weeks, becoming progressively more emaciated. At necropsy, 1 calf had typically shallow ulcers of the mucous membrane of the hard palate and buccal areas. Similar shallow ulcers were found throughout the length of the esophagus but were not marked in the abomasum. The mucosa of the colon was markedly congested and covered with a thick mucus. There was some hemorrhage from the mucosa in the rectum.

Ten calves that had been born late were separated by a distance of about one-half mile from the main group of 180 calves. The owner reported that only 1 of the 10 calves became ill.

An interesting observation by the owner was an illness among skunks in his vicinity during the winter and spring of the same year. Some skunks were found dead and others were sick; one was evidently blind. The sick skunks, usually found around the hay stacks, were readily killed. The illness in skunks began about December, 1953, and the last sick skunk was noted about the middle of May, 1954. Unfortunately, this observation was not known until too late to obtain any material for study.

HISTORY OF HERD B

This epizootic occurred in a herd of 223 Hereford calves that had been raised on the home ranch. The calves were born in the

From the Department of Animal Pathology and Hygiene, University of Nebraska, Lincoln. Dr. Olson is now with the Department of Veterinary Science, University of Wisconsin, Madison.

Published with the approval of the director as paper No. 781, journal series, Nebraska Agricultural Experiment Station, Lincoln.

spring of 1955, kept on pasture during the summer, and weaned in September. From October 1 to October 10, they were fed oats, which had been raised on a nearby farm, and blocks of compressed soybean oil meal. Benzene hexachloride and chlordane were mixed with oil and were used to saturate burlap pads on posts in the pasture which the calves used for rubbing. In September, the calves were sprayed with the same insecticide mixture to remove lice. Beginning October 10, they were fed a ration consisting of corn, ground alfalfa raised on the same farm with no chemical fertilizer or treatment, and cottonseed pellets (the same brand of feed but a different size pellet was fed to the cows). Roughage consisted of oat hay and prairie hay fed on alternate days. The baled oat hay contained a variety of weeds, none of which could be identified as toxic, and most bales contained some growth of mold* in the outside layers.

Illness began in the calves on November 24. Affected animals refused to eat, were markedly depressed, and died after about three days. Three calves had nasal discharge and all developed diarrhea on the last day of illness. The sick calves did not respond to large doses of sulfonamides and antibiotics. Several veterinarians were consulted and various tentative diagnoses were made which included hemorrhagic septicemia, lead poisoning, and mucosal disease. The early cases were reported to have shown ulcerative stomatitis, ulcerative gastroenteritis, and localized peritonitis at necropsy.

Fifteen days after the first evidence of disease, 53 new calves were added to the group in which the disease was occurring. These calves had been raised in the vicinity but on different premises and had no previous apparent illness. Mucosal disease did not develop in any of the new calves despite continuous contact with affected animals for more than four months.

On December 15, the twenty-first day of the epizootic, 1 calf was brought to the laboratory for examination. The calf had been sick for two days but had been chilled from a 250-mile ride in an open truck. Its temperature was 101 F. It was held for observation and during the night developed a profuse diarrhea with much mucus. It was depressed and weak and there was also a copious mucous discharge from the nostrils. Blood was taken for cell counts and chemical analyses. Twenty-four hours after arrival, the temperature was 104.1 and the general condition of the calf was very poor. It was killed for necropsy.

There were numerous shallow ulcers in the mouth, some covered with exudate, at the margin of the ventral aspect of the tongue, and numerous small ulcers in the pyloric portion of the abomasum. A few of the Peyer's patches were congested with a moderate degree of necrosis. The left parotid lymph gland was moderately enlarged and edematous but not congested. Portions of the liver and kidney were examined chemically for heavy metals and found negative. A tentative diagnosis of mucosal disease was made.

Because of experience in a previous epizootic of mucosal disease (herd A) which occurred principally in one of two groups of calves kept separate from each other, the owner was advised to separate the calves and move one group from the "affected" environment. This was possible with his facilities and because of the addition of new calves a special effort was made to study the situation.

On December 23, the thirtieth day of the epizootic, the entire group of calves was divided so that each group contained half of the original and half of the new calves. One group was moved to a new environment and fed a different brand of soybean supplement. A week later, rectal temperatures were measured in all of the calves in an attempt to learn any significant differences between the two groups. In the original lot, 120 calves had temperatures less than 104 F., 8 had temperatures of 104 to 105, and 1 had a temperature higher than 105. In the new environment, 121 calves had temperatures of less than 104, 6 had temperatures of 104 to 105, and 1 had a temperature higher than 105. Thus, there was no essential difference in temperatures of calves in the two environments. Most of the calves with elevated temperatures had no other signs of infection and there was no correlation between elevation of temperature and subsequent illness. Many

*Dr. Joseph Forgacs, Lederle Laboratories, Division of American Cyanamid Company, Pearl River, N. Y., examined a sample of the hay and found it heavily contaminated with fungi, the most prevalent being a strain of Aspergillus chevalieri morphologically resembling a strain of A. chevalieri toxic to calves. Other fungi isolated included a species each of Scopulariopsis, Fusarium, Alternaria, two species of Aspergilli and three unidentified dematiaceous fungi.

calves of both groups had diarrhea and some had mucus in the feces.

On January 10, 17 days after separation into two groups, temperatures were again taken. There was still no significant difference between the calves in the original lot or those in the new area. Results on the entire group were as follows: 180 calves had temperatures less than 104; 59 calves had temperatures of 104 to 105; and 15 had temperatures over 105. No mucus was noted in the feces, although a number of calves had diarrhea. One calf, recently dead, had lesions typical of mucosal disease.

During the epizootic, markedly sick calves were placed in a small lot as soon as noticed. Only 3 of these calves recovered and were returned to the herd. During the first three weeks, 13 calves died, the following three weeks 8 died, and 1 died each week during the following two months. During the fourth month, no new cases developed; however, in the fifth month, 2 additional calves developed the disease and died. According to the owner, calves not showing clinical disease made essentially normal gains in weight and condition.

ATTEMPTS AT TRANSMISSION

During the epizootic in herd B, materials for transmission trials were obtained at three different times. Blood and tissues were harvested from 2 calves that had died of mucosal disease, 1 of which (calf 9, table 1) had been artificially exposed on the premises during the outbreak. Blood was obtained from 7 calves with elevated temperatures, 2 of which had mild evidence of mucosal disease. None of the 7 calves showed progressive symptoms of mucosal disease and all remained alive.

The materials used for inoculation consisted of mixtures of blood and tissues from several calves. Different combinations were used with the hope that an active agent would be included.

Two steers, 12 and 17 months old, were artificially exposed twice, three weeks apart, with material from calves 1, 3, 6, and 8 (table 1) for first exposure and material from calf 1 (table 1) for second exposure. A calf, 3 months old, received only one exposure with material from calf 1 (table 1). The exposures consisted of 2 to 10 ml. of material inoculated intravenously, 1 to 2 ml. intranasally, and several drops on scarified oral mucous membrane. The animals developed no significant symptoms such as elevated body temperature or changes in the number of circulating leukocytes.

By the thirty-fifth day of the epizootic in herd B, it had become apparent that mucosal disease was not likely to develop in the new calves added to the herd 20 days before. This led to the belief that the calves in the original herd, in which the epizootic of mucosal disease was occurring, might have been predisposed by a contributing factor which had its effect before the new calves entered the epizootic area. This idea was tested by experimental exposure of 4 calves in the herd; 2 were calves added to the herd 20 days previously and 2 were a part of the original herd. All 4 were apparently normal and had not been visibly affected with mucosal disease. An inoculum was prepared from a calf with a fatal case of mucosal disease (calf 1, table 1) and a calf showing evidence of mild illness (calf 4, table 1). The 4 calves were given the mixture of these materials intravenously and intranasally. One of these test calves, selected from the original group, became ill nine days later and died 15 days after exposure with typical lesions of mucosal disease (calf 9, table 1). The other 3 calves remained well. Fresh material from the

TABLE 1—Materials Used for Preparation of Mucosal Disease Inoculums from Herd B with Remarks on Status of Animal at Time Material Was Collected. The Various Combinations of Material Used Are Indicated in Context

Calf	Date	Materials: Frozen and stored −65° C. except* glycerinated	Remarks
1	12/16/55	Blood, lymph gland*	Died after 3 days illness
2	12/29/55	Blood taken during febrile period	Temp. 105.5, no symptoms.
3	12/29/55	Blood taken during febrile period	Temp. 105.4, no symptoms.
4	12/29/55	Blood taken during febrile period	Temp. 104.5, depressed, and mucus in feces.
5	12/29/55	Blood taken during febrile period	Temp. 104.5, no symptoms, neutropenia.
6	12/29/55	Blood taken during febrile period	Temp. 104.8, oral lesions, diarrhea, and leukopenia.
7	12/29/55	Blood taken during febrile period	Temp. over 104.0.
8	12/29/55	Blood taken during febrile period	Temp. over 104.2.
9	1/25/56	Blood; lesions from mouth, intestine and abomasum; liver; spleen; lymph glands; and thymus	Died 15 days after exper. exposure.

dead calf was given to another apparently normal calf of the original group in an attempt at serial transmission. This animal did not develop mucosal disease.

Since the result of experimental exposure of calves in the environment of herd B was suggestive of a predisposing factor, samples of the cottonseed cake, oats, and insecticides fed or used prior to development of mucosal disease were obtained for experiments in the laboratory. Two calves, 4-months-old, were fed the cottonseed cake and oats and were sprayed with the commercial insecticides every other day for 38 days prior to experimental exposure with mucosal disease material from calves 2, 5, 7, and 9 (table 1). These test calves remained normal. A calf, 4 months old, which was not treated with the suspected environmental elements but was exposed to the same inoculum also remained normal.

DISCUSSION

Mucosal disease has not been experimentally produced with regularity using material from naturally infected animals. This is in contrast to some other diseases of cattle with which mucosal disease has been compared, such as virus diarrhea,[6,7] rhinotracheitis,[8,9] and rinderpest.[10] The etiology and experimental production of malignant catarrhal fever is still somewhat obscure,[11] although successful and serial transfer of the condition by injection of infectious material in lymph nodes has been reported.[12]

The factor of environment is involved in the development of malignant catarrhal fever under natural conditions since evidence indicates that sheep and wildebeest[13] may serve as carriers of inapparent infection which can be transmitted to cattle. Environment may also play a role in rhinotracheitis which usually develops after cattle have been kept in feedlots for about two months.[9] Experimental calves kept under isolated laboratory conditions and exposed to rhinotracheitis material developed only a mild reaction, whereas those similarly exposed and kept under feedlot conditions developed the typical disease.[14]

Our attempts at experimental transmission of mucosal disease were negative except for 1 calf which was part of the group affected with the disease. This animal died 15 days after it had received material from a calf with mucosal disease. Since 1 comparable calf that had received the same material remained well, the significance of the positive result is uncertain.

The situation in herd B in which 53 new, presumably susceptible calves were added to a group affected with mucosal disease was an unusual opportunity to look for evidence of contagion. If direct contagion were a significant factor, mucosal disease should have developed in some of the new calves if they were susceptible. Using the data on mortality in the herd beginning one week after introduction of new calves, there was about 9 per cent mortality among the original group of calves (18 cases among 210 calves). A similar mortality among the 53 newly added calves should have yielded 4 to 5 cases of mucosal disease. The fact that none were observed seems quite significant. If credence can be given to development of mucosal disease in 1 of the 2 original calves experimentally exposed, a predisposing factor might be suspected to have existed prior to introduction of the new calves. Attempts to investigate some factors, such as cottonseed cake and oats which had been fed, and insecticidal preparations which had been used prior to the epizootic, were without result.

There was a suggestion of environmental influence in the history of the other epizootic of mucosal disease (herd A). In this epizootic, 53 of 180 calves in the main group were affected with the disease, an infection rate of nearly 30 per cent. A smaller group of 10 calves was maintained separately on the same ranch. In this group, the owner reported only 1 mild case of the disease. If a similar rate of infection had occurred in the smaller group, about 3 cases should have been observed.

A third epizootic of mucosal disease in young range cattle provides some information, although the evidence is sketchy. In this situation, illness was first observed in 6 yearling calves when the herd of over 200 was brought in from summer pasture. Fifteen head were missing and their carcasses were found in the pasture. Several more cases of illness developed, some of which were diagnosed as mucosal disease by a veterinarian whose description of lesions substantiated the diagnosis. Six calves, sick when brought in from pasture, were placed with another group of 150 apparently normal calves. Although 1 of the sick animals died, there was no evidence of contagion to the group of 150 calves presumably exposed to the infection.

Mucosal disease of cattle may be highly contagious and could exist as a subclinical infection leading to immunity. Such an immunity from a previous subclinical infection could explain failures of experimental transmission and absence of mucosal disease in the 53 new calves added to herd B.

SUMMARY

Observations have been made on mucosal disease in herds of beef calves. Attempts at experimental transmission of the disease to calves kept under laboratory conditions have been negative. One calf kept in the environment of a mucosal disease epizootic and experimentally exposed died of mucosal disease 15 days later. A similar calf treated in a like manner remained well. The attempt at transmission from the experimental calf that died was negative.

Fifty-three calves introduced during the early part of the epizootic in one herd remained well.

While the history of two herd epizootics suggested operation of environmental factors which may predispose to the disease, their existence could not be defined. The possibility of an immunity status as result of nonapparent infection must also be considered.

References

[1]Ramsey, F. K., and Chivers, W. H.: Mucosal Disease of Cattle. North Am. Vet., *34*, (1953): 629-633.

[2]Ramsey, F. K.: The Pathology of Mucosal Disease of Cattle. Proc. Book, AVMA (1954): 162-167.

[3]Schipper, I. A., Eveleth, D. F., Shumard, R. F., and Richards, S. H.: Mucosal Disease of Cattle. Vet. Med., *50*, (1955): 431-50.

[4]Pritchard, W. R.: The Mucosal Disease of Cattle—Epizootiology, Symptomatology, and Experimental Studies. Proc. Book, AVMA (1955): 37-42.

[5]Olafson, Peter, MacCallum, A. D., and Fox, F. H.: An Apparently New Transmissible Disease of Cattle. Cornell Vet., *36*, (1946): 205-213.

[6]Baker, J. A., York, C. J., Gillespie, J. H., and Mitchell, G. B.: Virus Diarrhea in Cattle. Am. J. Vet. Res., *15*, (1954) 525-531.

[7]Pritchard, W. R., Taylor, D. B., Moses, H. C., and Doyle, L. P.: A Transmissible Disease Affecting the Mucosae of Cattle. J.A.V.M.A., *128*, (1956): 1-5.

[8]McKercher, D. G., Moulton, J. E., and Jasper, D. E.: Virus and Virus-like Cattle Disease Entities New to California. Proc. U. S. Livestock San. A. (1954): 260-269.

[9]Jensen, R., Chow, T. L., and Brown, W.: Report on Infectious Rhinotracheitis. Conference on Upper Respiratory Disease and the Mucosal Disease Complex in Cattle. Denver, Colo. (1955): 18-19.

[10]Hagan, W. A., and Bruner, D. W.: The Infectious Diseases of Domestic Animals. Comstock Publishing Assoc., Ithaca, N. Y. (1951): 805.

[11]Stenius, P. I.: Bovine Malignant Catarrh. Monograph from Institute of Pathology, Veterinary College, Helsinki, Finland (1952): 1-92.

[12]Piercy, S. E.: Studies in Bovine Malignant Catarrh. I. Experimental Infection in Cattle. Brit. Vet. J., *108*, (1952): 35-47.

[13]Piercy, S. E.: Studies in Bovine Malignant Catarrh. V. The Role of Sheep in the Transmission of the Disease. Brit. Vet. J., *110*, (1954): 508-516.

[14]Jensen, R.: Personal communication, 1956.

Anthrax in the Wyoming Mountains

An atypical epizootic of anthrax, said to be the worse in United States history, was discovered on Aug. 19, 1956, when a practicing veterinarian, Dr. Bert Reinow of Pinedale, Wyo., reported sudden deaths in cattle and moose in the nearby mountain ranges. Investigations by state and federal officials revealed that at least 58 cattle and 18 moose had died, usually without evidence of struggling, during the first 21 days of August. One bull has died since then, on September 5.

The epizootic occurred among approximately 11,000 cattle in 22 herds on summer ranges in three national forests (Bridger, Teton, and Shoshoni) which are separated by some fences but mostly by natural barriers. The 20- by 30-mile area is 8,000 to to 10,000 ft. above sea level and encloses the headwaters of three rivers (Green, Snake, and Wind), thereby constituting a serious threat to a widespread region.

Anthrax had not previously been seen in this area. The only new cattle introduced had been replacement bulls and the only feed supplement used was block salt. From 25 to 33 per cent of the dead were bulls, although the bull to cow ratio was about 4 to 100 (4%). A positive diagnosis of anthrax was made on many cattle but on only 2 of the 18 moose.

CONTROL PLANS

Since losses had stopped and the cattle would soon descend to the home ranges, it was decided that immediate vaccination was not imperative. Three control plans were suggested to the owners who unanimously favored the first. It provided for: normal return of the cattle (Oct. 1 to 10) to the home ranch, unless more losses should occur; segregation for another 10 to 14 days, or six weeks from the last death; and vaccination next spring (No. 3 intradermal spore vaccine for cattle, No. 2 for horses) of all animals to be returned to the forest

ranges. This would not interfere with normal marketing procedures.

A detail under supervision of federal veterinarian Dr. R. C. Knowles took charge, on September 11, of destroying all carcasses in the area by burning, if possible, or by burying; also of searching for new evidence of anthrax. He reported that the best source of material (from decomposed carcasses) for laboratory diagnosis was from the frontal sinuses, which were opened as in dehorning.

Other organizations aiding in the control program include the Forest Service and the Game and Fish Commission.—*Submitted on Oct. 4, 1956, by G. H. Good, D.V.M., state veterinarian, Pinedale, Wyo.*

Erythrocyte Sedimentation Rate and Hematocrit

C. E. BILD, D.V.M.

Miami, Florida

Clinicians use temperature readings and leukocyte counts to obtain general and nonspecific information. The same type of information is obtainable through the use of the erythrocyte sedimentation rate (E.S.R.). Although the E.S.R. is a nondiagnostic test, that is, it denotes no specific condition, it has high clinical value. Often, one may suspect there is something wrong with an animal that is virtually asymptomatic. Indeed, this is one of the best uses for E.S.R.[1]

ERYTHROCYTE SEDIMENTATION RATE

In chronic involvements of the dog, a decrease in the rate of sedimentation of the erythrocytes often points to improvement of the condition.[2] In this respect, men and dogs are alike.

Healthy dogs show a near-zero E.S.R. reading, although there are many exceptions to this general rule. This is also true of temperature readings; but a normal temperature does not always indicate that a patient is healthy. Likewise, an animal with a distinct, and sometimes fatal, liver involvement may have a zero E.S.R. and, perhaps, a prolonged blood-clotting time of as much as ten minutes or more.

In clinical practice, puppies that appear well and have a zero E.S.R. are frequently observed. Later, the same puppies may be presented with a history of "just not being right." Many times these puppies, which previously had a zero or practically zero E.S.R., are now asymptomatic but show a definitely accelerated E.S.R. In such cases, we administer distemper serum and penicillin-streptomycin daily for a few days. In a large percentage of animals, this routine does not cause the E.S.R. to return to near zero immediately; however, we follow the procedure for the same reason that we carry a spare tire in our automobile. We follow this routine whether or not the puppy has had any of the present-day vaccines. We think it unwise to give permanent distemper vaccine or to perform elective surgery on young animals while the E.S.R. is appreciably accelerated.

Nevertheless, the puppy that has an elevated temperature and appears "slow" usually has few complications if the E.S.R. remains constant at practically zero. On the other hand, a near-zero E.S.R. is also found in a puppy that is about to succumb from hookworms and an inadequate diet. Apparently, if the problem is confined to parasites and malnutrition, there is virtually no fall in the E.S.R. This is true even when the hematocrit (HCT) is 10 or 15 per cent. Such cases can usually be defined satisfactorily, but not if the animal is afflicted with liver dysfunction. If the E.S.R. shows an appreciable acceleration, the clinical problem presented by the puppy is not always easy to solve.

Some old animals with nephritis have a highly accelerated E.S.R. But the animal with a chronic nephritis, whose nutrient intake has compensated for maintenance and wastage of body essentials, often shows only moderate sedimentation of erythrocytes. Decrease in the E.S.R., in nephritis, is sometimes of prognostic value.

An extremely ill animal may have a correspondingly rapid E.S.R., and the fall of the erythrocytes can be watched; in one animal it fell 125 mm. in ten minutes in a Westergren tube.

Great variations in E.S.R. are observed in animals with clinical problems. For example, it is possible to find in a dog with pyometra, 80,000 leukocytes per cubic millimeter. Should there be a profuse discharge from the uterus, the count may change to 30,000 or 35,000 per cubic millimeter in three or four days. This does not particularly indicate an improvement in the animal's condition but is mentioned as a

Dr. Bild is a small animal practitioner in Miami, Fla.

variation that may be seen in a leukocyte count in a specific case. There may be distinct variations in the E.S.R. in specific disease conditions.

Erythrocyte sedimentation rate may be easily explained to the client by saying that the fall of the erythrocytes is in direct proportion to the extensiveness and seriousness of the illness. Selye[3] says increased E.S.R. occurs almost always in stress situations. Others[4,5] believe accelerated E.S.R. usually accompanies leptospirosis.

As practicing clinicians, we eagerly look forward to the day when research workers will correlate simultaneously the temperature, weight, hematocrit, blood-clotting time, leukocyte count, erythrocyte sedimentation rate, and an indicator of kidney and liver function in cases of pure distemper, pure infectious canine hepatitis, and pure *Leptospira canicola* and *Leptospira icterohaemorrhagiae* infections. One person should be able to do all these tests in less than six minutes, with the exception of the leukocyte count.

In severe distemper, the E.S.R. is accelerated, blood urea nitrogen is low, and the clotting time is three or four minutes. In cases of distemper encephalitis, the animal often appears seriously ill and usually there is a highly accelerated E.S.R. However, the animal that has lost little or no weight or hemoglobin level at the onset of the encephalitis, may have a near-zero E.S.R. Some years ago, we had examinations made of liver sections taken from 15 dogs with encephalitis, that were subjected to euthanasia; no infectious hepatitis inclusion bodies were found.

EQUIPMENT AND METHODS

We find the Westergren tubes satisfactory for making sedimentation tests. In contrast, the Wintrobe tubes do not seem to be accurate in the middle ranges of E.S.R. in our laboratory, but this may be due to occasional failure on the part of laboratory technicians to properly care for the glassware.

As a clinical screening test to determine desirability for a more accurate E.S.R. study, as with Westergren tubes, we use heparinized capillary tubes* in which to mount the column of blood. These require only a drop of blood and the results are clinically consistent. Two tubes are used for each study. As soon as the blood is drawn, the capillary tubes are filled and sealed at one end by means of a portable burner. Then they are placed vertically on a piece of adhesive tape which has been previously mounted on a wall surface. Adding machine paper is pasted on the side to provide writing space for the animal's name and the times the E.S.R. is to be checked, the intervals being about 15, 30, and 60 minutes. If small air bubbles appear in the column of blood, false readings will result. The sedimentation is read in degrees from zero to 4 plus.

The clinical value of E.S.R. studies is high, but the cost of the test and equipment is low. Three Westergren tubes and rack will cost $10; the Aloe heparinized capillary tubes cost less than 2 cents each.

HEMATOCRIT

Hemoglobin, erythrocyte count, and hematocrit (HCT) or packed cell volume all furnish the clinician with the same general, nonspecific information.

Hematocrit tests made with Wintrobe tubes and a centrifuge (3,000 r.p.m.) require 30 minutes. However, considerable time can be saved, with no loss of accuracy, through the use of a high-speed capillary centrifuge (10,000 r.p.m.), with columns of blood in sealed heparinized tubes which produce an HCT reading in three and one-half minutes. The capillary centrifuge machine† has a capacity of 24 tubes and costs $175. The disposable capillary tubes are the same type as are used in the E.S.R. screening test.

Considerable error has occurred in clinical erythrocyte counts and in clinical routine color-matching hemoglobin determinations,[6,7] whereas the capillary hematocrit test is quite accurate, the margin of error being less than 2 per cent.

Generally speaking, when blood of a mature healthy animal is centrifuged with an anticoagulant to allow maximum packing of the cells, the column is approximately half erythrocytes and half plasma (HCT 50%). Sometimes the normal HCT may go as high as 55 per cent. In our practice, in the average well-cared for, virtually parasite-free puppy, it is around 35 per cent, while in those best cared for it is in the lower 40 per cent. Highly parasitized and poorly fed puppies, about to succumb, may have a HCT as low as 10 per cent. In two exceptional cases, puppies with a 6 per cent HCT survived.

In severely dehydrated animals, the HCT is of particular value in determining the daily clinical progress. There is a correlation between the elevated hematocrit, the amount of dehydration, and the weight.

*Manufactured by the A. S. Aloe Co., St. Louis, Mo., No. 23922.

†Manufactured by International Equipment Co., Boston.

Also, in disease situations there may be any combination of a decrease in the erythrocytes being produced and an increase in the number being destroyed. There is also an early correlation between the ill animal that is daily losing weight or hematocrit level, or both. This alone makes the entire routine worthwhile.

Recently, an extremely ill dog, 12 years old, was presented with a history of vomiting for two days. The HCT was 65. The animal was hydrated and in 48 hours the HCT was 42, which was normal for this dog. No other treatment was necessary.

The animal with jaundice (leptospiral or phosphorus poison) may show an almost unbelievable range of the HCT during the course of the illness. The serum in the capillary tube from the normal dog is colorless, that from a jaundiced animal is colored. However, jaundice occasionally is detected in the serum before it is evident on routine examination of the animal.

One of the most fascinating procedures I know is to run a series of HCT and weight checks of the growing puppy; with us, this has become clinical routine. Diet, weight, and hemoglobin formation are found to be closely related.

An excellent correlation was found to occur[8] between the hemoglobin, HCT, and erythrocyte counts. In our clinic, we made a check of more than 600 hemoglobin determinations with the colorimeter, and HCT determinations with the high-speed capillary hematocrit machine and the results were similar.

In the mature animals, we record the HCT, the weight, and the results of the urine tests. These records permit comparative evaluations of an animal at a later date. In growing dogs, weight increase is important, but weight and hematocrit readings *together* are an indication of the rate of growth. Often one sees, especially after many illnesses, animals whose weight or weight gain is satisfactory but whose HCT is not adequate. In practically every clinical problem of the small animal, these two determinations are of value and are best made simultaneously.

No early correlation occurs between blood loss and hemoglobin or HCT levels in the mature animal, for this is a problem in blood volume.[9] However, in the severely anemic animal, and especially in the young anemic puppy, there is usually an almost immediate correlation between the HCT, the hemoglobin reading, and the volume of a blood infusion. We use 8 cc. of whole blood or 10 cc. of A.C.D.‡ blood per pound of body weight. Usually when a transfusion is given, the animal does not maintain the HCT level supplied by the transfused blood. On the other hand, we recently transfused 240 cc. of whole blood or 300 cc. of A.C.D. blood every other day for four infusions into a 56-lb. dog suffering from chronic nephritis and probably from heartworm pneumonia. The HCT before the infusion was 29 per cent and it did not materially increase. Two weeks later, however, the dog showed definite improvement in general well-being and in HCT level. Although the HCT did not improve immediately, probably the actual blood volume of the animal did.

The HCT of 2 Boston Terriers that had cesarotomies at our clinic was 23 and 28 per cent, respectively, before anesthesia. Each received 240 cc. of whole blood at the beginning of the operation. Two weeks later, the HCT of 1 had increased from 23 to 47 per cent, the other from 28 to 42 per cent. Incidentally, at the time of the operations each was given, in addition to the blood, 300 cc. of a water-dextrose-electrolyte combination. If, prior to doing a cesarotomy the HCT is 30 per cent or less, a blood transfusion is given during the operation.

In another recent case, we performed a cesarotomy and a panhysterectomy on a 20-lb. Boston Terrier which had experienced four previous cesarotomies. A severe hemorrhage occurred during surgery. She was given 480 cc. of whole blood and 300 cc. of an electrolyte combination intravenously. Her HCT was 39 per cent before anesthesia and remained at that level for the next four days. She ate and took care of her puppies in a normal manner.

Good clinical use can be made of the simultaneous hematocrit and weight determination in almost every examination of the animal.

References

[1]Weintrobe, Maxwell M.: Clinical Hematology. 3rd ed. Lea and Febiger, Philadelphia (1951): 293.
[2]Selye, Hans: Stress. Acta Inc., Montreal, Canada (1950): 442-443.
[3]Selye, Hans: Stress. Acta Inc., Montreal, Canada, 1950.
[4]McIlnay, J. N.: Method of Diagnosis of Leptospirosis in Dogs. M.S.C. Vet., *9*, 1949.

‡A.C.D. blood = 4 parts blood, 1 part of acid, citrate, dextrose preservative.

[5]McIlnay (quoting Monlux, William S.): Leptospirosis. Cornell Vet., *38*, (1948): 57, 109, 199.
[6]Ham, Thomas Hale: A Syllabus of Laboratory Examinations. Harvard University Press, Cambridge, Mass. (1952): 46, 93.
[7]Cartwright, George E.: Diagnostic Laboratory Hematology. Grune and Stratton, New York (1954): 12, 18.
[8]Schalm, O. W., and Wood, Margaret: Observations on the Use of Certain Hematological Techniques in Canine Medicine. Proc. Book, AVMA (1954): 286.
[9]Price, Philip, B.: Blood Volume in Health and Disease. J.Am.M.A., *145*, (March 17, 1951): 781-785.

Mosquitoes and Dirofilaria Tenuis.—The infected larvae of *Dirofilaria tenuis* (Chandler, 1942) were found in the proboscis of certain mosquitoes ten to 12 days after a blood meal on infected raccoons. Attempts to infect young raccoons with bites from infected mosquitoes were inconclusive.—*J. Parasitol., Aug., 1956.*

Published evidence that both mosquitoes and fleas may act as vectors for *Dirofilaria immitis* (canine) is more speculative than substantive. There is no definite information on the mode of escape of the infective filarial larva from the intact flea host.—*J. Parasitol., Aug., 1956.*

Ducks kept on a fluke-infested pasture will help prevent infection in host animals by eating many of the snails, thus interrupting the life cycle of the flukes.—*Ayrshire Dig., Aug. 15, 1956.*

A New Tailless Breed of Sheep.—A breed of sheep that requires no docking has been developed at the South Dakota Experiment Station by crossing native breeds with fat-rumped, tailless sheep originally imported from the steppes of Siberia in 1913. When the no-tail breed is crossed with other breeds, the tails of the lambs average 6½ to 8 inches at birth, about 2 inches less than normal.—*Breeder's Gaz., Oct., 1956.*

Chinchilla News Resumed.—After several months in which news of the Chinchilla Association of America was carried in the American Fur Breeder, that arrangement has been cancelled. The reason given is that many of those who market chinchilla pelts are unwilling to "sell their pelts for what they are instead of for what the promoters . . . would like them to be." These people seem to feel that they must perpetuate the idea that chinchilla is a "precious fur." At public sales, a high percentage of pelts offered have not been sold even after close culling and grading.—*Am. Fur Breeder, Sept., 1956.*

Honeybees Have Real Estate Agents.—When a newly formed swarm of bees wishes to move from the old colony, they dispatch experienced forager bees as scouts to select a new home. Upon return, several scouts report at the same time by dancing before the swarm. Their enthusiasm for the new location is indicated by the length and vivacity of the dance which may last an hour or more. After several days, a decision is made and the swarm moves to the chosen location.—*Sci. News Letter, Sept. 15, 1956.*

Tranquilizing Drugs and Fighting Fish.—A simple method of evaluating tranquilizing drugs was sought. By dissolving the drug in water, nine of 12 agents tested produced depression in Siamese fighting fish, and with seven drugs they were unwilling to fight. Morphine sulfate and sodium salycilate increased their aggressiveness.—*Science, Sept. 7, 1956.*

The nutria (South American beaver) breeding business may be following the pattern previously followed by promoters of chinchillas. Buyers are warned to "beware of nutria sellers."—*Fur Breeder, Aug. 11, 1956.*

An Ayrshire cow, 4 years old, recently produced 23,458 lb. of milk and 915 lb. of butterfat in 305 days. This is a new milk record for twice-a-day milking for all breeds at that age.—*Ayrshire Dig., Sept. 15, 1956.*

"The man who sits up all night with a sick cow, or catches catnaps on a cot in the hog-farrowing house on a cold winter's night, is just as much a humanitarian as the person who rescues a cat from a tall tree."—*Livestock Conservation, Inc., Chicago, Ill.*

Starling flocks sometimes contain 60,000 birds.—*Sci. News Letter, Sept. 29, 1956.*

Surgery and Obstetrics
and Problems of Breeding

Three Tumors of the Bovine Uterus

JOSEPH SIMON, D.V.M., Ph.D., and S. H. McNUTT, D.V.M.

Madison, Wisconsin

TUMORS OF reproductive organs of cows are rare and of little economic significance in the cattle industry. The authors' experience has been that metastatic tumors of lymphoid origin usually affect the uterus. According to reports[4] of the U.S.D.A., the epithelioma, a squamous cell carcinoma, is the most common tumor of cattle; however, in Wisconsin the tumor that most commonly involves general health seems to be the lymphosarcoma. Squamous cell carcinomas are usually subject to early surgical removal. Our collection includes neither tumors of the cervix nor primary tumors of the udder.

A few bovine vaginal tumors examined appeared to be benign, but they were microscopically malignant. The reproductive organ of the cow usually affected with primary tumors in the ovary.

REVIEW OF LITERATURE

In his review of the literature, Feldman[1] found records of nine carcinomas of the bovine uterus, but reported none in his own collection. He did not state whether these were primary tumors or if they affected the cervix or the uterus proper. In 1936, the collection of neoplasms of domesticated animals at Onderstepoort, South Africa, was said[2] to be "one of the most complete in the world, and certainly the largest in any tropical or subtropical country." At that time, the collection consisted of about 3,000 specimens. A single bovine uterine tumor, a histiocytic sarcoma, was mentioned but was not described.

Monlux *et al.*[3] described 26 cases of adenocarcinoma of the uterus of the cow; 22 had lung metastases, 21 had lymph node metastases, and 14 had peritoneal metastases.

CASE REPORTS

The following report is on uterine tumors from 3 cows. The first of these affected animals was a 5-year-old Holstein-Friesian that had given birth to 4 normal calves one year apart. Her uterus had involuted normally within 30 to 60 days after each calving, except the last on Feb. 9, 1952. Two months after this last calving, firm masses could be palpated in the uterus. Because the cow developed mastitis in all quarters and was losing weight, she was sent to slaughter.

Published with the approval of the director of the Wisconsin Agricultural Station as paper NS 205 from the Department of Veterinary Science, University of Wisconsin, Madison.

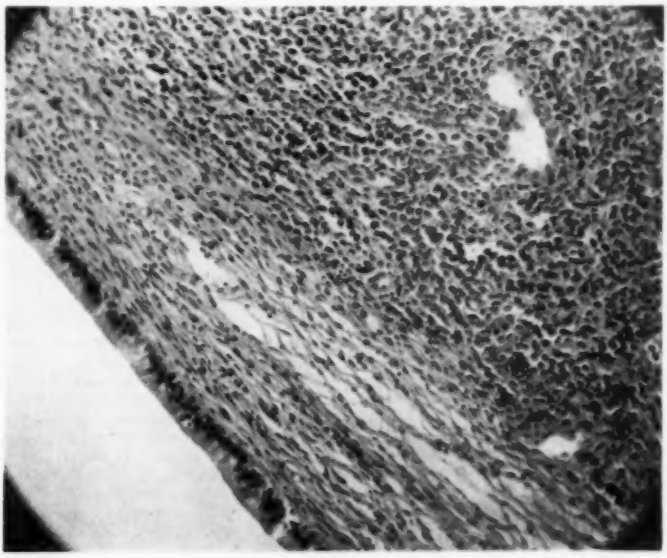


Fig. 1—Reticulum cell sarcoma in the endometrium of a cow, with displacement of grandular elements. x 131.25.

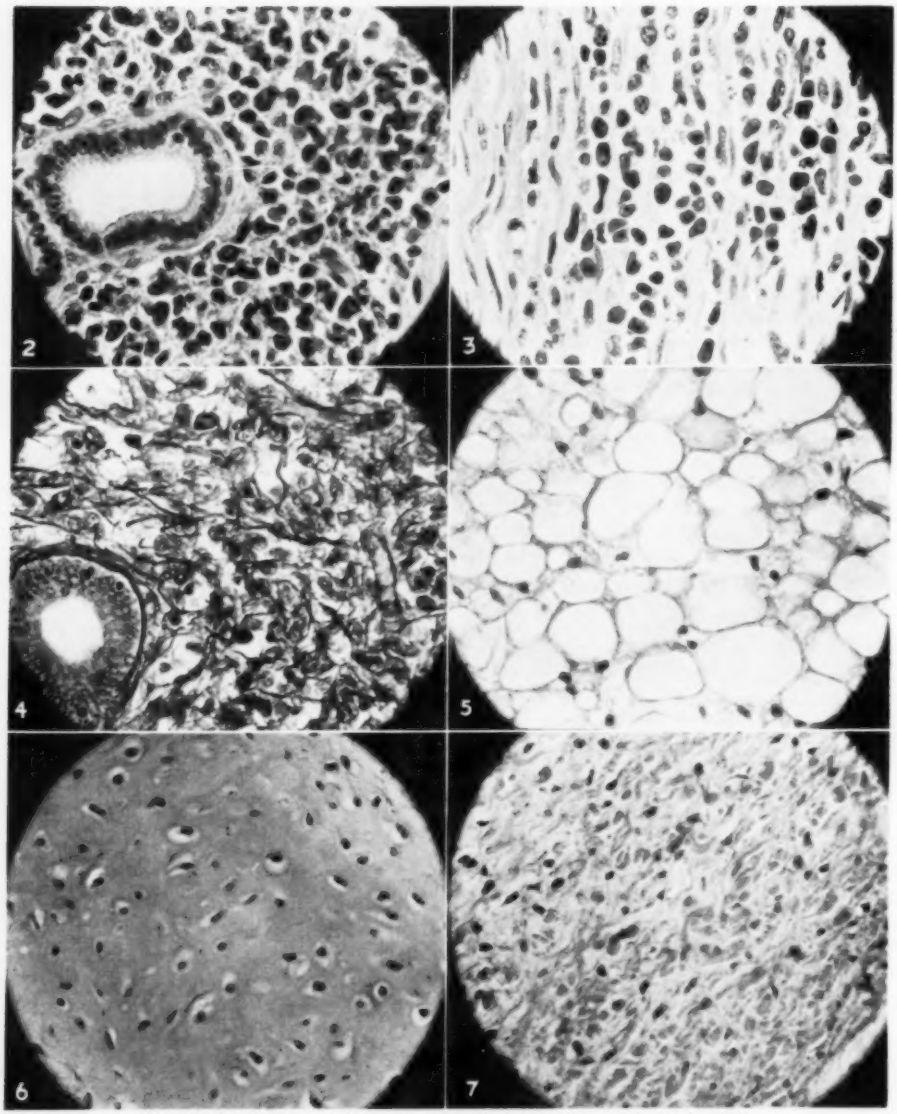


Fig. 2—Neoplastic reticulum cells surrounding an endometrial gland. x 400.
Fig. 3—Neoplastic reticulum cells invading the myometrium. x 400.
Fig. 4—Reticulum stain; Foot's modification of Bielschowsky's method, showing extensive reticulum network; bovine reticulum cell sarcoma. x 400.
Fig. 5—Fatty tissue elements in mixed tumor in a cow. x 300.
Fig. 6—Cartilaginous elements in mixed tumor of bovine uterus. x 300.
Fig. 7—Connective tissue component of mixed tumor of uterus. Tissue essentially collagenous. x 300.

Only the uterus from the animal was obtained for examination, although the postmortem inspection record showed there were tumors in the liver, lungs, and the mesenteric and retroperitoneal lymph nodes similar to the one in the uterus.

Grossly, the uterus was enlarged, the walls were thickened, and contained grayish

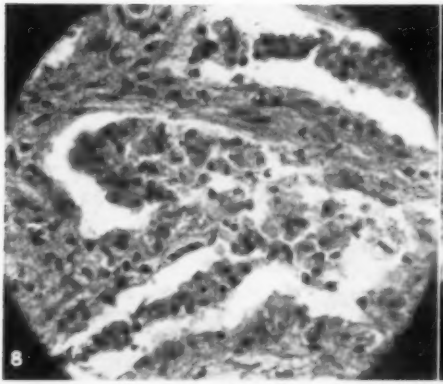


Fig. 8—Hemangioma of endometrium characterized by papillary folds lined by endothelial cells. x 300.

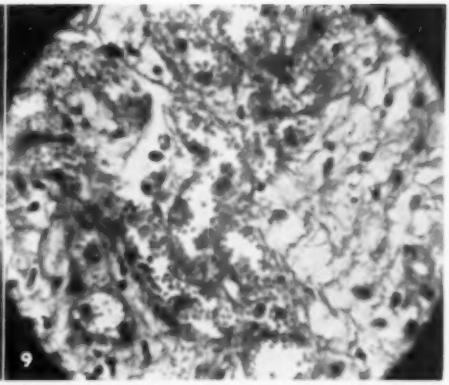


Fig. 9—Hemangioma of bovine endometrium showing angiomatous spaces containing erythrocytes. x 300.

tan tissue elevations. The caruncular areas were also displaced by this firm neoplastic tissue. A mass of the tumor extended ventrally to the bladder and surrounded a tubular structure which was believed to be the ureter. The transverse diameter of this new growth at its widest point was 8 cm. Tissues taken for histopathological study were fixed in Mossman's fixative. Microscopic examination revealed an anaplastic tumor composed of cells containing nuclei which varied in size, shape, and staining quality (fig. 1, 2). The cells contained moderate to scant amounts of cytoplasm. Many of the cells appeared stellate, with a suggestion of processes being extruded from them. The uterine glands and epithelium of the endometrium, neither of which had undergone neoplasia, were mainly displaced by the neoplastic growth. Neoplastic cells had invaded and displaced the myometrium (fig. 3), and islands of tumor cells were found in many lymph channels.

Reticulum stains, periodic acid, leukofuchsin, and Foot's modification of Bielschowsky's method (fig. 4) revealed an extensive reticulum fiber network among the cells within the nests of cells and a suggestion of fine reticulum fibers streaming from many of the anaplastic cells. The diagnosis may be either a stromal cell or reticulum cell sarcoma but the latter is favored by the authors.

The second affected animal was a Holstein-Friesian heifer. The limited history indicated that three similarly appearing tumor masses were removed from the uterus following a dystocia. Two of the tumors were 15 cm. in diameter and the third was 30 cm. Since these tissues were not strongly adherent to the endometrium, the practitioner asked if they might represent an "undeveloped twin." Microscopic examination revealed tissue consisting primarily of cartilaginous elements, fat, blood vessels, and connective tissue (fig. 5, 6, 7). The diagnosis was mixed tumor.

The third affected animal was slaughtered two months after she should have calved. The veterinarian reported that the "gravid horn" seemed normal, but the body of the uterus was greatly thickened, doughy to the touch and its endometrial surface felt rough, almost like a rasp.

Microscopic examination revealed an endometrium composed of papillary folds containing spaces lined by a single layer of endothelial cells. The material contained in the spaces consisted of red cells, necrotic amorphous debris, and some calcific deposits (fig. 8, 9). The diagnosis was hemangioma.

References

[1]Feldman, W. H.: Neoplasms of Domesticated Animals. W. B. Saunders Co., Philadelphia (1932): 300.

[2]Jackson, C.: The Incidence and Pathology of Tumours of Domesticated Animals in South Africa. The Onderstepoort J. Vet. Sci. and Anim. Indust., 6, (1936): 439.

[3]Monlux, A. W., Anderson, W. A., Davis, C. L., and Monlux, W. S.: Adenocarcinoma of the Uterus of the Cow. Differentiation of Its Pulmonary Metastases from Primary Lung Tumors. Am. J. Vet. Res., 17, (1956): 45-73.

[4]Meat Inspection Branch, U.S.D.A., ARS: Summary of Activities for the Fiscal Year 1954.

Clinical Data

Actinobacillosis of Cattle

D. A. SANDERS, D.V.M., and M. RISTIC, Dip. Vet., D.V.M., M.S.

Gainesville, Florida

OCCURRENCE of actinobacillosis, a granulomatous disease of cattle and other animals, due to *Actinobacillus lignieresi*, has been reported by workers from many countries throughout the world.[4-9] Moreover, *A. lignieresi* has been recovered from fatal cases of Actinobacillus bacteremia encountered in man.[10,11] Reference was made recently[1] to the importance of the disease, its rapid spread where control measures are neglected, methods of handling it, and to recommended treatments. Actinobacillosis is becoming more prevalent in Florida cattle, as reported by practicing veterinarians. Clinical and pathological similarity of this bacterial disease to certain stages of rarefying osteitis, due to *Actinomyces bovis*, make it important to differentiate the two conditions. Apart from isolation of the microorganism, clinical differentiation is based upon tissue structures involved. Lesions due to ray fungus and to actinobacillosis may occur simultaneously within the same animal or herd, but the latter condition is commonly confined to the soft tissues and does not involve bone structures as does actinomycosis.

The causative microorganism of actinobacillosis may be readily isolated from characteristic lesions. The literature reveals confusing discrepancies regarding pathogenic, antigenic, and biochemical characteristics of different strains of Actinobacillus. This may tend to leave doubt regarding the over-all importance of the disease among cattle. For this reason, it seemed desirable to reinvestigate the actinobacillosis problem in cooperation with practicing veterinarians located in different sections of Florida.

CLINICAL OBSERVATIONS

The following description of the disease as it developed in a herd of beef cattle in the lower central section of Florida is typical. During May, 1954, a bull with a subcutaneous granulomatous lesion of the mandible region was introduced, for breeding purposes, among a herd of beef heifers under semirange conditions. Within five months, 8 to 10 heifers had developed discernible granulomatous swellings of the anterior cervical region. Other similar cases developed later. The lesions would often rupture and discharge their contents. The affected cattle usually remained in good physical condition, particularly during the early phases of the disease. To prevent the spread of the infection, the owner eventually resorted to slaughter of affected animals. Thus, approximately 35 were disposed of for beef purposes.

In the meantime, a veterinary diagnosis was established. The affected cattle showed characteristic granulomatous lesions, up to 12 cm. in diameter, which were confined to the soft tissues.

Representative samples of the diseased tissue were removed surgically, packed in ice, and forwarded to the Department of Veterinary Science, Florida Agricultural Experiment Station, for study. The subcutaneous lesions (fig. 1) consisted of a tough fibrous capsule, 1 to 3 cm. thick, surrounding soft grayish, mucoid suppurative material. This material, when examined with aid of a dissecting microscope, was found to contain a variable amount of granular-like substance. The older lesions were firm in consistency, with a capsule composed of several district concentric layers of connective tissue.

Excised disease tissue was seared, macerated in a sterile grinder, diluted with saline, and plated for isolation of microorganisms on blood-agar and brain-heart infusion mediums. Study of the colonial morphology of the organisms grown on the above mediums revealed three distinct variants, representing fluorescent, granular, and dwarf types. Detailed biochemical and cell morphological studies proved the microorganism to be *A. lignieresi*.

The pathogenicity of the freshly isolated *A. lignieresi* for cattle is summarized (table 1). The organism was cultured on Albimi agar plates for 48 hours at 37 C., washed off in saline, and standardized to a preferred density.

From the Department of Veterinary Science, Florida Agricultural Experiment Stations, University of Florida, Gainesville.

This report represents some practical aspects of the technical paper by Ristic, M., Herzberg, M., Sanders, D. A. and Williams, J. W.: Actinobacillosis. I. An Evaluation of Cultural Characteristics of Selected Strains of Actinobacillus Lignieresi. Am. J. Vet. Res., 17, (1956): 555-562.

Fig. 1—Granulomatous lesions of the cervical region excised from cattle with naturally acquired actinobacillosis. Necrotic center surrounded by fibrous tissue is evident.

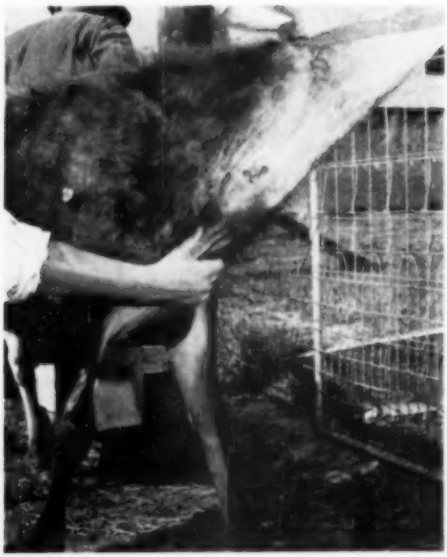


Fig. 2—Developing cervical granuloma at inoculation site three months following injection of Actinobacillus lignieresi.

EXPERIMENTAL PROCEDURES

Five bulls, 6 to 9 months old, were inoculated subcutaneously on either side of the neck with 5 ml. of the saline suspension of the organism and held under observation in isolation pens. Two of the 5 developed clinical granulomas at the site of injection within three months (fig. 2), and pure cultures of *A. lignieresi* were recovered from the lesions. During the fourth month following the injection, 1 of the 2 began to lose condition, developed severe respiratory difficulties characterized by labored breathing, nasal and lacrimal discharges, and succumbed within a week.

TABLE 1—Results of Subcutaneous, Intramuscular, and Oral Exposure of Young Cattle to Actinobacillus Lignieresi

Inoculated	No. of animals	Dosage	Period before clinical actinobacillosis noticed	No. of animals infected (bacteriological and clinical evidence)	Remarks
Subcutaneously.	5	5 ml.*	3 months.	2	Both developed cervical granulomas at the inoculation sites; 1 also showed pulmonary infection.
Intramuscularly (tongue, hard palate, and cheek).	3	3 ml. (1 ml. each respective site).	.....	All negative.	.....
Orally.	2	50 ml. (saline suspension of infected tissues).	.....	All negative.	.....

Experiment terminated six months following exposure.

*Counts of the several suspensions used were 4-5 x 10^6 cells per milliliter.

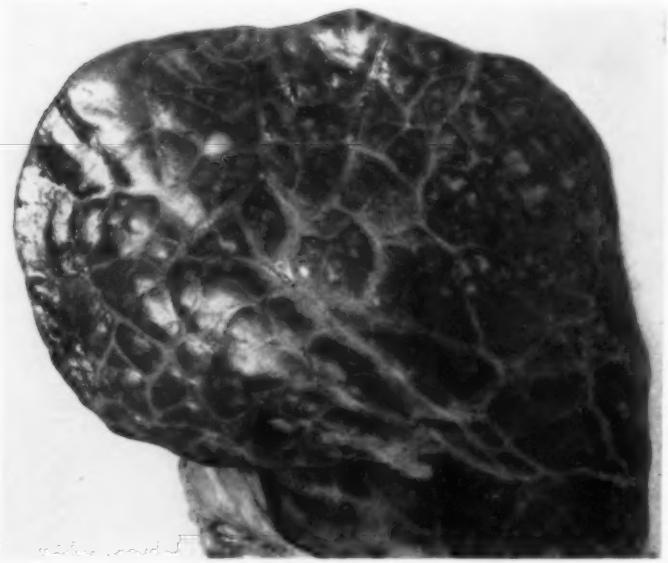


Fig. 3—Bovine lung three months following subcutaneous inoculation of Actinobacillus lignieresi, strain FM. Numerous minute, shotlike, yellowish white nodules are present.

On necropsy, the lung surface of this animal exhibited numerous minute, shotlike, yellowish white nodules (fig. 3). Upon sectioning the lung, a number of areas containing similar nodular lesions were observed throughout its substances. Pure cultures of *A. lignieresi* were obtained from these nodules. Histopathologically, the affected tissue revealed numerous necrotic foci, containing rosettes surrounded by inflammatory cells and granulation tissue (fig. 4).

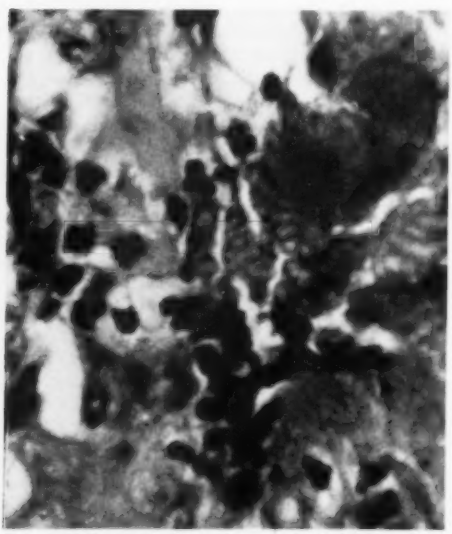


Fig. 4—Club-bearing rosettes surrounded by lymphocytes and granulating tissue, from an animal naturally infected with Actinobacillus lignieresi.

Three additional cattle, inoculated intramuscularly in the tongue, hard palate, and cheeks with a 1-ml. suspension of the organism in each respective site, developed no local lesions and remained in good health for six months, at which time the experiment was terminated. Also, material prepared from infective tissue, by reduction to fine particles in a Waring blendor, failed to reproduce the disease when administered as a drench to 2 yearling bulls. The 10 test animals were held under controlled conditions in a screened, insectproof, isolation building having individual stalls of galvanized iron panels set in concrete floors.

DISCUSSION

The mode of natural infection and metastatic activity of the several colonial variants of *Actinobacillus lignieresi* and the methods of treatment of actinobacillosis are in need of further intensive investigation.

Favorable clinical response has been reported to intravenous sodium iodide

therapy in actinomycosis and actinobacillosis[2] and to parenteral use of streptomycin for actinomycosis.[3]

Complete surgical removal or injection of iodine into the central mass of the diseased tissue, or both, proved valuable in arresting the proliferating process. Observations on *in vitro* sensitivity of 14 selected strains of *A. lignieresi* to antibiotics and chemotherapeutic agents showed that aureomycin,® terramycin,® and chloromycetin® inhibited growth in the lowest dilutions studied.

References

[1]Aitken, W. A.: Editorial. J.A.V.M.A., *122,* (1953): 130-132.

[2]Farquharson, J.: Intravenous Use of Sodium Iodine in Actinomycosis. J.A.V.M.A., *91,* (1937): 551-554.

[3]Kingman, H. E., and Palen, J. S.: Streptomycin in the Treatment of Actinomycosis. J.A.V.M.A., *108,* (1951): 28-30.

[4]Lignieres, J., and Spitz, G.: Contribution a l'etude a la Classification et a la Nomenclature des Affections Connues sous le nom d'actinomycose. Centrabl. f. Bakt. I. Abt. Orig., *35,* (1903): 294-308.

[5]Lignieres, J., and Spitz, G.: L'Actinobacillose. Bull. Soc. Cent. Méd. Vét., *20,* (1902): 487-535.

[6]March, H., and Wilkins, H. W.: Actinobacillosis in Sheep. J.A.V.M.A., *94,* (1939): 363-364.

[7]McFadyean, J.: *Actinobacillus Lignieres.* J. Comp. Path. and Therap., *45,* (1932): 93-105.

[8]Thomas, A. D.: Actinobacillosis and Other Complications in Sheep Which May Arise from the Feeding Prickly Pear (Opuntia Spp.). Rep. Direct. Vet. Serv. and Anim. Indust., Union South Africa (1931): 215-229.

[9]Tunnicliff, E. A.: A Study of *Actinobacillus Lignieresi* from Sheep Affected with Actinobacillosis. J. Infect. Dis., *69,* (1941): 52-58.

[10]Beaver, D. C., and Thompson, L.: Actinobacillosis of Man. Report of a Fatal Case. Am. J. Path., *9,* (1933): 603-623.

[11]Thompson, L., and Willius, F. A.: Actinobacillus Bacteremia. J.Am.M.A., *99,* (1932): 298-301.

A Bovine Mucosal Disease in Britain.—A disease characterized by ulcers of the mouth and alimentary tract has been encountered on 35 farms in Britain since 1953. It has been diagnosed as "acorn poisoning," "dirty mouth," or malignant catarrah. It is associated with fever, leukopenia, foot and skin lesions, and abortions. It has been reproduced experimentally. Of the mucosal type diseases described in America, it most closely resembles virus diarrhea, New York, but there is less salivation and nasal discharge. There are probably many mild undetected cases.—*Vet. Rec., Sept. 15, 1956.*

A Quill Mite of Poultry—A Case Report

O. SCHWABE, D.V.M.

New Brunswick, New Jersey

During the past year, 7 cases of quill mite in chickens were diagnosed at the New Jersey State Poultry Laboratory in Vineland. The mite, identified as *Syringophilus bipectinatus,* was found infesting commercial flocks of White Leghorn and Plymouth Rock birds ranging in age from 9 months to 2 years. This is the first time *S. bipectinatus* has been found in this area, and is the first record of it from chickens in the United States since it was reported in five flocks of chickens and in turkeys and golden pheasants in Ohio in 1932.[1]

The flocks were raised on separate farms located in three adjacent counties of New Jersey. Of 29 birds examined, 22 (76%) were infested. The owners were not aware of the presence of the mite in their flocks at the time they submitted the birds to the laboratory for postmortem examination. There apparently had been no direct contact between the birds on the several farms, and it was not possible to determine the effect of the parasitism on the rate of egg production because the flocks had suffered from diseases which invariably lower egg production.

The appearance of the plumage of the infested birds was unusual. Many of the small body feathers were missing and some of the large tail and wing feathers were broken, giving the birds the appearance of molting. The most striking feature, however, was in the quills where the normal transparent pith had been replaced by a brownish powder. It was in this powder or debris that the adult, the nymphal, and the larval stages of the mite were found.

Syringophilus bipectinatus was first reported from Europe in 1880[2] when it was found in the quills of chickens and pigeons. Up to 90 per cent of the chickens examined in the province of Schleswig-Holstein were parasitized. A detailed description of the mite, together with methods for preservation and staining, was given in 1882.[3] It

From the New Jersey Agricultural Experiment Station, Rutgers University, the State University of New Jersey, Department of Animal Pathology; paper of the journal series.

The author thanks Dr. H. M. Martin, chairman of the Department of Parasitology, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, for his assistance in preparing the morphological description.

was first reported in the United States in 1895[4] when it was found on the feathers of the black flycatcher *Phainopepla nitens*.

Syringophilus bipectinatus is a slender mite of medium length with a cone-shaped anterior end and a rounded posterior end. While alive, it is ovoid-to-cylindrical on cross section. Measurements on mounted specimens show adults up to 1.0 mm. in length by 0.19 to 0.27 mm. in width; nymphs up to 0.79 mm. in length by 0.11 to 0.25 mm. in width; and larvae up to 0.59 mm. in length with a width up to 0.22 mm. The cuticle is finely striated and has a moderate number of simple setae of various lengths arranged in a specific pattern over the body and appendages. The peritremes are lateral between the second and third coxae. The anal orifice is terminal.

The gnathosoma, which forms the anterior part of the mite, bears the mouth parts together with a pair of protrusible chelicerae and a pair of pedipalpi. The latter structure projects forward to about the anterior end of the outstretched anterior pair of legs. The chelicerae are slender, medium lengthed, stylet-like structures which terminate as a lateral, movable, four-barbed blade, and a medium, slightly shorter, needle-like digit (magnification x 1,000 or greater). The pedipalpi are conspicuous, composed of five articles, and are inserted on a midlateral expansion of the gnathosoma. On the anterior end of the fifth article (tarsus), there is a short anteriorly projecting, club-shaped sensory structure and two ventrally curved guard bristles. The shorter, cone-shaped, first and second pairs of legs are on the anterior third of the body (propodosoma), and the longer third and fourth pairs occur on the middle third of the body (metapodosoma). The terminus (tarsus) of each leg has a pair of claws and a pair of comblike pulvilli. The latter is distinctive of the mite and, because of the appearance of this structure, the name *bipectinatus* was chosen for the species.

It is believed[5] that the mite enters the quill through the upper umbilicus, which remains open until the quill fuses to the shaft, and makes its exit through the inferior umbilicus after the feather is shed. No definite information, however, exists about the manner in which the parasites infest the host and, consequently, no specific method for its control has ever been described, although apparently it would be advisable to dispose of affected birds and clean and disinfect their quarters.[6]

References

[1]Rebrassier, R. E., and Martin, E. D.: *Syringophilus Bipectinatus*, a Quill Mite of Poultry. Science, *76*, (1932): 128.

[2]Heller, A.: Die Federspulmiben die Schmarotzer. Leipzig, (1880): 186-188.

[3]Norner, C.: *Syringophilus Bipectinatus*. Oesterr. Vrtljschr. f. wissensch. Veterinärk., *57*, (1882): 91-148.

[4]Hancock, L. J.: Am. Naturalist, *29*, (1895): 382-384, 866-867.

[5]Trouessart, E. L.: Sur les Acariens qui vivent dans le tuyau des plumes des oiseaux. Compt. rend. Acad. d. sci., (1884): 1130.

[6]Biester, H. H., and Schwarte, L. H.: Diseases of Poultry. 3rd ed. Iowa State College Press, Ames, 1952.

Turkey Erysipelas and Antibiotics

The effectiveness of several antibiotics, of sulfamezathine, and of furazolidone against *Erysipelothrix rhusiopathiae* was tested (1) *in vitro*, (2) in experimentally infected day-old chicks, and (3) in experimentally infected turkeys.

In the *in vitro* test, penicillin, oxytetracycline, chlortetracycline, and furazolidone were highly effective, while streptomycin and chloramphenicol were moderately effective and sulfamezathine was completely ineffective. In the infected chicks and turkeys, only oxytetracycline in oil (100 mg./kg.) and benzathine penicillin were effective in single doses (given intramuscularly). Other forms of these two antibiotics were effective but only in multiple doses.

In infected turkeys, the effective single dose of benzathine penicillin (16,000 units/kg.) was much smaller than the effective dose in chicks (160,000 units/kg.). Treated turkeys were completely resistant to reinfection and no lesions were found on necropsy.—*H. Williams Smith in J. Comp. Path. and Therap., April, 1956.*

Virus Pneumonia of Pigs.—Antibiotics have been ineffective against viruses except those of the psittacosis-lymphogranuloma group and the "gray-lung" virus of mice. However, experiments show that virus pneumonia of swine can be prevented when chlortetracycline or oxytetracycline is injected into pigs a few hours before they are inoculated with suspensions of infected tissue. Streptomycin was slightly beneficial but all other antibiotics and sulfonamides tested were ineffective. None of these agents had any effect once infection was established, nor were they active against the infective agents *in vitro*.—*J. Comp. Path. and Therap., April, 1956.*

Tetracycline, which has shown excellent prophylactic activity against virus pneumonia in pigs, failed to reduce the pneumonic lesions, as compared with untreated controls, once the infection was established. —*Vet. Rec., Sept. 8, 1956.*

What Is Your Diagnosis?

Because of the interest in veterinary radiology, a case history and accompanying radiographs depicting a diagnostic problem are usually published in each issue of the JOURNAL.

Make your diagnosis from the pictures below—then turn the page ▶

Fig. 1—Chest radiograph, lateral view.

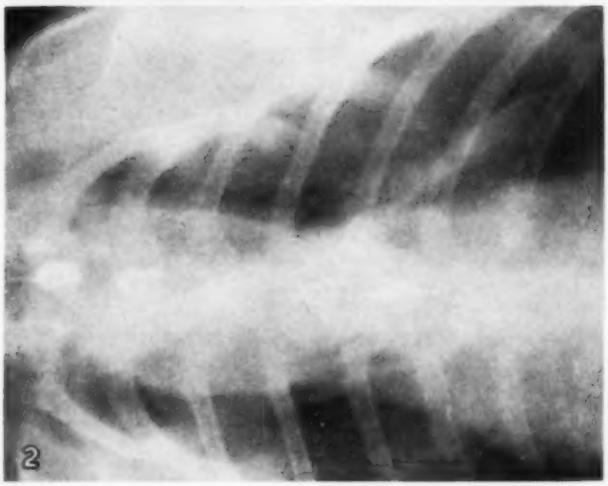


Fig. 2—Chest radiograph, dorsoventral view.

History.—A mixed breed, male dog, 2 years old, was well until three or four months before examination. During that period, a progressive expiratory dyspnea had developed, but the dog was otherwise quite normal. Ventrodorsal and lateral radiographs of the chest were taken.

(Diagnosis and findings are reported on next page)

Here Is the Diagnosis

(Continued from preceding page)

Radiological Diagnosis.—A circumscribed mass is present, either in or around the trachea, slightly anterior to the base of the heart.

Necropsy.—A nodular mass 1.5 cm. in diameter was found, involving the wall of the trachea just anterior to the bifurcation and nearly occluding the lumen. On incision, the lesion contained esophageal worms, *Spirocerca lupi*.

Authors' Notes.—An exploratory thoracotomy proved the lesion to involve the tracheal wall just anterior to the bifurcation. Due to the location and extension of the mass, it was thought to be inoperable and euthanasia was performed.

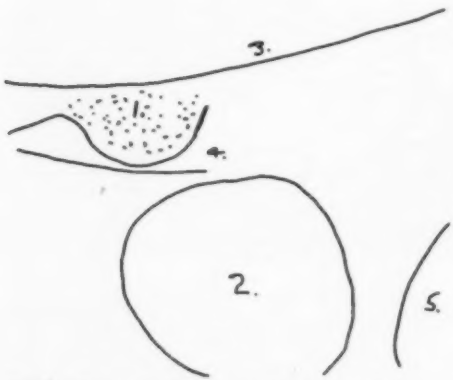


Fig. 1—Drawing of chest of the dog: (1) tumor; (2) heart; (3) spinal column; (4) trachea; (5) diaphragm.

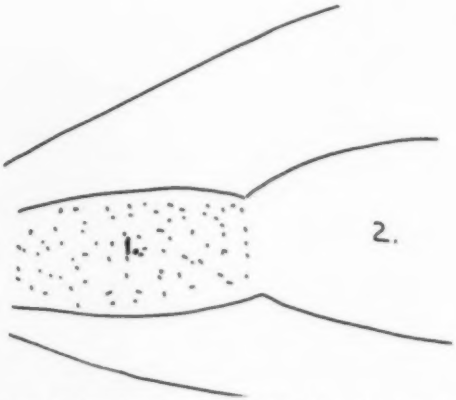


Fig. 2—Drawing of chest of the dog: (1) tumor; (2) heart.

This case was submitted by Drs. B. F. Hoerlein and E. M. Jordan, Veterinary Clinic, Alabama Polytechnic Institute, Auburn, Ala. Publication 613, approved by the Committee on Publications, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn.

Dr. Jordan is presently at the School of Veterinary Medicine, Texas A. & M. College, College Station.

Ecological and Epizootiological Studies on Canine Coccidioidomycosis

LIBERO AJELLO, Ph.D.; RAYMOND E. REED, D.V.M.; KEITH T. MADDY, D.V.M.; ALEXANDER A. BUDURIN, D.V.M.; JANE C. MOORE

Atlanta, Georgia, and Tucson, Arizona

IN THE ENDEMIC areas, man and many other animal species become infected by *Coccidioides immitis*. Until recently, few cases of canine coccidioidomycosis had been reported,[1-11] even though there is evidence that dogs are among the more susceptible of the lower animals. In southern Arizona, from October, 1952, to July, 1955, 52 cases were diagnosed in dogs.[12]

In central Arizona, from September, 1954, to May, 1956, one of the authors (K. T. M.) observed more than 100 canine cases of disseminated coccidioidomycosis. Other evidence indicates that most dogs in central and southern Arizona eventually become infected, but many are asymptomatic. Canine coccidioidomycosis seems more prevalent than hitherto supposed.

The development of coccidioidomycosis among a group of dogs in Tucson presented an opportunity to investigate the epidemiology and to study the ecology of the mycological agent, *C. immitis*.

Five related, purebred Collies (dogs A-E) were involved in the epizootic. In the autumn of 1952, the owner and her 5 dogs moved from Detroit, Mich., to a suburban foothill area where homes were scattered in tracts of desert land. The dogs were allowed the freedom of the back yard which was enclosed by a masonry wall. Occasionally, they were exercised on leash along the front driveway.

CLINICAL HISTORY

The dogs were given routine veterinary care from the time of their arrival. Dog A, a 7-year-old male, first showed illness late in April, 1954 (18 mo. after arrival). A slight fever, accompanied by diarrhea, vomiting, and inflamed tonsils, was treated symptomatically, with good response. Two weeks later, his temperature increased to 105.2 F. and persisted for 96 hours when he died. Cardiac embarrassment was marked during the terminal 24 hours. Permission for necropsy was denied.

Dog B, a 2-year-old female, had periods of vomiting and anorexia in the spring of 1953, but whelped a normal litter in August. She became more seriously ill in September, 1954. She developed persistent anorexia, vomiting, intermittent fever, a mild cough, and signs of cardiac insufficiency, including edema of the hindlegs. Dorsoventral and lateral thoracic radiographs revealed an enlarged heart shadow, increased density of bronchial shadows, and a few small, dense foci in lung parenchyma (fig. 1, 2). Heart sounds were muffled. She died in October. The necropsy findings, which will be described, revealed disseminated coccidioidomycosis.

Dog C, a 3-year-old female, began showing unthriftiness in February, 1954, and continued to lose weight until early in September when she developed intermittent fever, anorexia, vomiting, pleural sounds, and weakened rapidly. She became stiff in the hindlegs, and diarrhea and ascites developed late in October. A coccidioidin skin test, using 0.1 ml. of undiluted coccidioidin* intradermally into the fold of the flank, proved positive at the end of 48 hours.† She was *in extremis* when euthanasia was carried out on December 10. Necropsy was not permitted.

Dog D, an 8-year-old female, suffered a period of vomiting in April, 1954. She responded to treatment, but her general condition remained poor. In November, a coccidioidin skin test was positive. Exacerbation occurred in January, 1955. Diarrhea and pharyngitis were controlled, but anorexia and fever with occasional vomiting and coughing persisted for the next six months. A second skin test, in March, evoked a greater reaction. She was markedly improved by December, 1955, but râles in the lower thorax continued in association with muffled heart sounds. A coccidioidin-sensitivity test in April, 1956, evoked a 4+ reaction.

Dog E, a 9-year-old female, showed fever, dyspnea, and some evidence of cardiac insufficiency for a 24-hour period in May, 1955. Recovery was apparently complete. On her first coccidioidin-sensitivity test, serveral months prior to her illness, the reaction was less than 5 mm.; on the second test, in April, 1956, it was 3+ with an induration of 20 mm.

One of the pups whelped in Tucson has been asymptomatic but now is positive to coccidioidin.

From the Communicable Disease Center, Public Health Service, U. S. Department of Health, Education, and Welfare, Atlanta, Ga. (Ajello, Maddy, and Moore); the College of Agriculture, University of Arizona, Tucson (Reed); and Dr. Budurin is a practitioner in Tucson, Ariz.

*Obtained through the courtesy of Dr. C. E. Smith, School of Public Health, University of California, Berkeley.

†Reactions of 5 mm. or more in diameter are considered positive.

GROSS PATHOLOGY—DOG B

The body was moderately emaciated. Edema of the hindlegs was less marked than it had been some time before death. Generalized passive congestion was evident throughout the thoracic and abdominal viscera.

Lungs.—A few pale gray, stellate scars, suggestive of current granulomatous activity, were widely distributed over the pleural surfaces as were several raised, translucent, gray foci (1-4 mm. diameter). Two circular lesions (15 and 40 mm.), one in the ventral portion of each lung, had slightly elevated, irregular surfaces. On cut section, they were dry and fibrous. White, gritty lesions, 1 mm. or less in size, were scattered over the pleural surfaces and through the parenchyma.

Lymph Nodes.—Two anterior mediastinal lymph nodes were enlarged to 10 by 15 mm. The nodes were firm but cut easily. A thin, purulent exudate could be expressed from the centers with some difficulty. Body lymph nodes were not affected.

Fig. 1—Dorsoventral radiograph of dog B. Note enlarged heart shadow and increased density of bronchial shadows. A few dense foci are present in lung parenchyma.

Heart and Pericardium.—The pericardial sac was grossly enlarged and the pleural surface appeared normal but contained approximately 200 ml. of brothlike fluid in which floated flakes of fibrin and fat globules. The inside of the sac and the surface of the heart were covered with a velvety, brownish red, adherent, nodular deposit. The pericardial tissue was 4 mm. thick, and the heart was of normal size but flabby. The ventricles were streaked with irregular yellowish areas that followed the planes of muscle fibers. No other lesions were found.

Tissues behind the diaphragm were not affected.

MICROSCOPIC PATHOLOGY—DOG B

Lungs.—Sections from the 40-mm. lesion consisted of areas of normal, but congested, lung bordering on a region in which the alveolar architecture was difficult to recognize because of infiltration by macrophages in association with fibrocytes. Calcium deposits in the walls of blood vessels were common and apparently were unassociated with other tissue changes.

One of the subpleural lesions, grossly identified as granuloma, consisted of a focus in which the lumina of the alveoli were packed with macrophages.

Peribronchial Lymph Node.—Lymphocytic elements were reduced and the follicular structure was largely replaced by immature collagenous tissue. An occasional giant cell could be found. Several immature sporangia of *C. immitis* were present (fig. 3).

Heart and Pericardium.—A section of the ventricle, from an area showing yellow streaks, consisted of muscle fibers widely

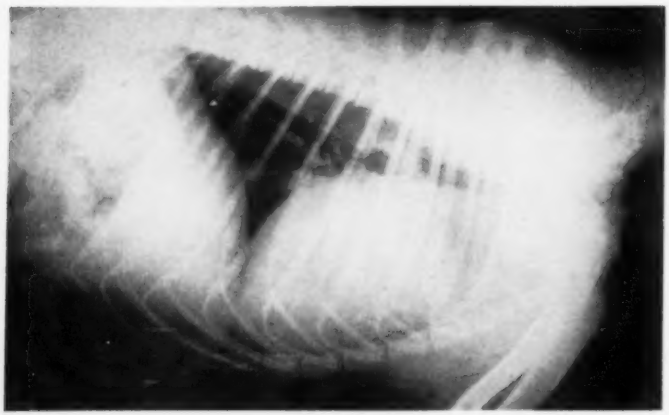


Fig. 2—Lateral radiograph of dog B.

separated by fat cells. Isolated groups of three or four fibers showed good cross striations, except in portions where fiber width was decreased and a hyalinized appearance predominated. Mycocardial fibers in another section of the ventricle did not show degenerative changes, but bundles of fibers were abnormally separated.

The epicardial surface was covered with a layer of granulation tissue, 1 mm. thick, which consisted of a rich capillary bed in a framework of reticular tissue, fibrocytes, and many plasma cells (fig. 4). This tissue was organized into villose projections on the free surface. Included in the structure of the granulation tissue were several bodies resembling attenuated *C. immitis* spherules.

The pericardium was much thickened by mature collagenous tissue and was covered on the inner surface with a new tissue, as was the heart.

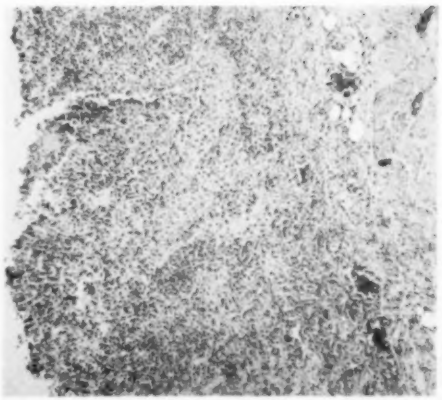


Fig. 4—Section of auricle from dog B. Development of villous projections of granulation tissue from surface of auricle. x 60.

DIAGNOSIS—DOG B

Clinical manifestations did not indicate coccidioidal infection, the first clue being the gross appearance of the lungs. Pericardial exudate, examined microscopically, revealed many spherical, thick-walled sporangia typical of the tissue phase of *C. immitis*.

Culture of the pericardial exudate in Sabouraud's dextrose agar produced fungus colonies that were white and cottony. Microscopic examination revealed the presence of barrel-shaped arthrospores, 2 to 3μ in diameter, typical of *C. immitis*. Confirmation of the morphological identification was obtained by injecting a 30-Gm. hamster intraperitoneally with 1 ml. of a saline

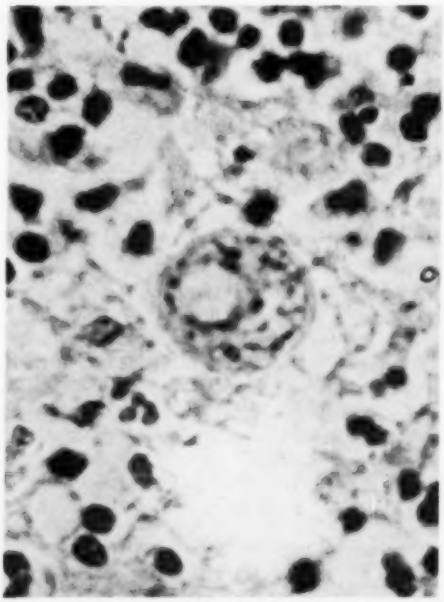


Fig. 3—Sporangium of Coccidioides immitis in section of dog B's peribronchial lymph node. x 536.

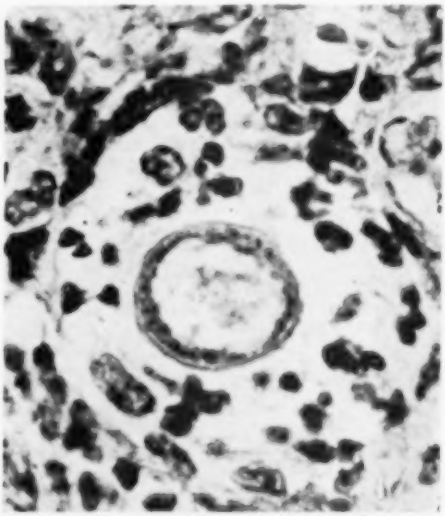


Fig. 5—Tissue phase of Coccidioides immitis that developed in hamster following injection of mycelium and arthrospores obtained from culture isolated from dog B. x 536.

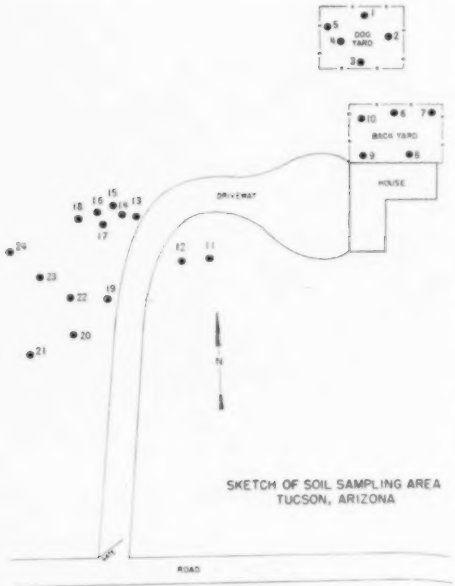


Fig. 6—Location of soil-collecting sites; site 16 yielded Coccidioides immitis.

suspension of spores and mycelian fragments obtained from one of the colonies. When killed three weeks later, thick-walled spherules containing endospores were observed in the fresh tissue smears made from kidney and liver lesions (fig. 5). The fungus was recovered from these organs by inoculating pieces of tissue in tubes of Sabouraud's dextrose agar. Stained histological section of spleen, omental fat, liver, kidney, gut wall, and lung revealed numerous granulomas containing spherules of *C. immitis*.

Ecological Observations

The home of the dogs' owner was located about 2 miles north of Tucson on a mesa, about 3,000 ft. in altitude, that leads upward to the base of the Santa Catalina mountains.

The area's vegetation is typical of that of the Lower Sonoran Life Zone. Creosote bush (*Larrea tridentata*), saguaro cactus (*Carnegiea gigantea*), ocotillo (*Fouquieria splendens*), bur sage (*Franseria deltoidea*), and palo verde (*Cercidium microphyllum*) predominate. Some prickly pear cactus (*Opuntia engelmanni*) are among the other plants growing there. Irrigation is not practiced in this area.

No domestic animals were present. Some of the common wild animals of the area are kangaroo rats, (*Dipodomys spectabalis spectabalis* and *Dipodomys merriami merriami*), pocket mice (*Perognathus flavus flavus*), ground squirrels (*Citellus tereticaudus* and *Ammospermophilus harrisii*), wood rats (*Neotoma albigula*), jack rabbits (*Lepus californicus* and *Lepus alleni*), and Arizona coyotes (*Canis mearnsi*).

Rainfall in the area averages about 12 inches per year, the bulk of which falls in midsummer and midwinter. Relative humidity is low and temperatures range from 25 to 115 F. in the shade.

These climatic conditions, which exist throughout most of the areas where *C. immitis* is endemic, undoubtedly play a significant role in the occurrence and development of this fungus in soil. A theory accounting for the distribution of *C. immitis* in the Southwest will be proposed in a later paper.[13]

Special studies were carried out to determine whether *C. immitis* was present in the soil of the area frequented by the dogs. Twenty-four soil samples were examined (fig. 6).

Isolation Procedure

An indirect isolation procedure,[14] somewhat modified,[15,16] was employed as follows:

1) Approximately, 10 Gm. of a thoroughly mixed soil sample was suspended in 30 ml. of physiological saline (NaCl, 0.85%) containing 5,000 units of penicillin and 1,000 units of streptomycin per milliliter.

2) The soil solution was vigorously stirred and was allowed to settle for one hour, which provided an opportunity for the antibiotics to inactivate any pathogenic bacteria.

3) The supernatant was then drawn off with a pipette, and 1-ml. aliquots were injected intraperitoneally into each of 4 mice.

4) Eight weeks following inoculation, the mice were killed and portions of their livers and spleens were inoculated into tubes of a neutral peptone-dextrose agar.‡ The tissues from each mouse were inocu-

‡Neopeptone, produced by Difco Laboratories, Inc., Detroit, Mich., 1.0 Gm.; dextrose, 1.0 Gm.; agar, 2.0 Gm.; and distilled water, q. s., 100 ml. adjusted to pH 7 before autoclaving at 120 C. for ten minutes. After cooking, 20 units of penicillin and 40 units of streptomycin per milliliter were added aseptically.

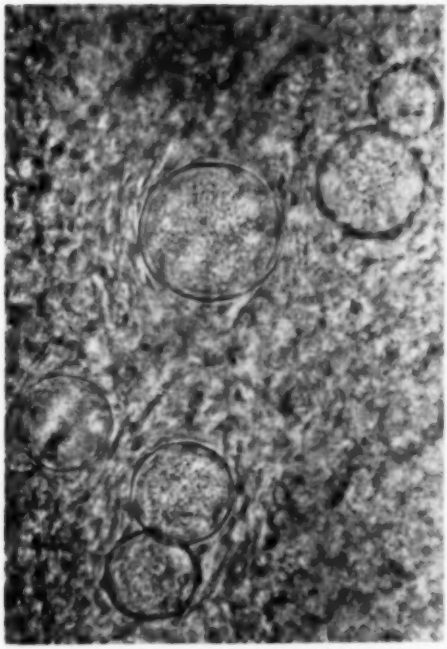


Fig. 7—Group of sporangia of Coccidioides immitis in tissue of mouse injected with soil suspension No. 16. Lactophenol cotton blue mount; x 220.

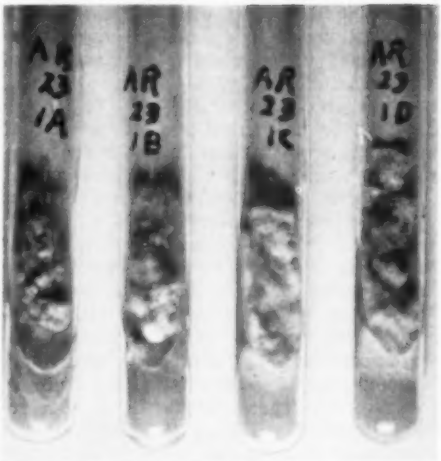


Fig. 8—Appearance of Coccidioides immitis in a group of primary isolation tubes inoculated with pieces of liver (A, B) and spleen (C, D) from mouse No. 1 which was injected with 1 ml. of soil suspension No. 16. (In the course of preparing the collecting site map (fig. 6), all the soil samples were renumbered; however, the original number remained on the tubes depicted).

lated into four tubes of medium, two with liver and two with spleen, making a total of 16 tubes for each soil sample.

5) The tubes were incubated at 25 C. and were examined at intervals over a period of six weeks for the development of *C. immitis*.

Coccidioides immitis was isolated from soil sample 16 (fig. 7, 8). Soil samples 1 through 10, 16, and 19 were collected on May 3, 1955, from various spots in the two yards where the dogs ran, as well as along the driveway where the dogs were exercised. The following types of habitats were sampled: exposed dry spots, moist areas under stones, soil contaminated by dog stools, soil from the base of plants, and diggings from rodent burrows. The positive sample (No. 16) came from the diggings of a rodent burrow at the base of a creosote bush that was located along the driveway (fig. 9). The dogs sniffed the rodent holes when they were exercised in that area.

On Dec. 14, 1955, after a summer of heavy rains, 11 more soil samples were collected (11-15, 17, 20-24). Although most of these were collected in the general vicinity of the positive sample and from rodent burrow diggings, none yielded *C. immitis*.

DISCUSSION

It is fully realized that only 1 of the 5 dogs involved in this study was unequivocally proved infected by *C. immitis;* however, all 5 dogs developed essentially similar symptoms. Dogs C, D, and E gave positive skin test reactions to coccidioidin, and all of their symptoms have been observed in other dogs with coccidioidomycosis.[11]

Fig. 9—Positive collecting site. Diggings from the rodent burrow in the foreground near the base of the creosote bush yielded Coccidioides immitis.

Presumably, all were equally susceptible to infection. In addition, the dogs were maintained under identical environmental conditions and had equal access to the soil that harbored *C. immitis*.

It is noteworthy that the soil sample that yielded *C. immitis* came from a rodent burrow. In previous studies,[17] 13.6 per cent of soil samples gathered from rodent burrows were positive, in contrast to a 3.4 per cent recovery from soils collected in other habitats. This is of great significance because soil samples have, in the past, been collected more or less at random,[18] with a consequent low recovery of the organism.

Coccidioides immitis must be considered, basically, as a saprophytic soil fungus. Moreover, its concentration in or near rodent burrows indicates that animal burrows offer "something in the environment that was conducive to the growth or concentration of *C. immitis*."[17] This association of a pathogenic fungus with an animal habitat parallels that of *Histoplasma capsulatum*. Field studies in Tennessee[19, 20] and in Peru[21] have shown that chickens, indirectly, and other birds, in an undetermined manner, favorably influence the development of *H. capsulatum* in soil.

Although biological factors significantly influence the development of a given fungus in soil, other conditions determine whether a particular area or region is a suitable habitat for the fungus. An analysis of the characteristics of the Lower Sonoran Life Zone,[22] whose limits encompass the endemic areas of *C. immitis*, indicates that an arid climate, mildly alkaline soil, and freedom from severe frosts best enable *C. immitis* to develop saprophytically in soil.

It is apparent that ecological observations on pathogenic fungi, when coupled with climatic studies of endemic areas, will ultimately serve to define the factors that determine endemicity.

SUMMARY

1) Coccidioidomycosis, involving all of 5 dogs brought into the vicinity of Tucson, Ariz., is described.

2) A soil sample collected near a rodent burrow in the yard where the dogs exercised yielded *Coccidioides immitis*.

3) The ecological characteristics of the Tucson area are described and discussed in relation to factors that determine the endemicity of *C. immitis*.

References

[1]Farness, O. J.: Coccidioidal Infection in a Dog. J.A.V.M.A., *97*, (1940): 263-274.

[2]Farness, O. J.: Coccidioidomycosis. J. Am. M. A., *116*, (1941): 1749-1752.

[3]Spriegel, J. M., and Milliff, J. H.: Coccidioidomycosis in a Dog. J.A.V.M.A., *112*, (1948): 244.

[4]Smith, H.: Coccidioidomycosis in Animals with Report of a New Case in a Dog. Am. J. Path., *24*, (1948): 223-233.

[5]Jasper, D. E., and Lewis, J. S.: Coccidioidomycosis in the Dog. North Am. Vet., *32*, (1951): 37-40.

[6]Cordy, D. R., and Hoop, J. D.: Coccidioidomycosis of the Skeleton in a Dog. North Am. Vet., *34*, (1953): 44-46.

[7]Watson, B.: Coccidioidomycosis in a Dog. Iowa State College Vet., *15*, (1953): 93-94.

[8]Hage, T. J., and Moulton, J. E.: Skeletal Coccidioidomycosis in Dogs. Cornell Vet., *44*, (1954): 489-500.

[9]Eville, T. B.: Case Report: Male Boxer. California Vet., *7*, (1954): 21.

[10]Reed, R. E.: Serology and Coccidioidin Skin Testing in Diagnosis of Canine Coccidioidomycosis. Proc. Book, AVMA (1954): 199-203.

[11]Short, G. E., Schleicher, E. M., and Rice, W. M.: Coccidioidomycosis in a Kansas Dog. J.A.V.M.A., *127*, (1955): 352-353.

[12]Reed, R. E.: Diagnosis of Disseminated Canine Coccidioidomycosis. J.A.V.M.A., *128*, (1956): 196-201.

[13]Maddy, K.: Ecological Factors Possibly Relating to the Geographic Distribution of *Coccidioides Immitis*. To be published.

[14]Stewart, R. A., and Meyer, K. F.: Isolation of *Coccidioides Immitis* (Stiles) from Soil. Proc. Soc. Exptl. Biol. and Med., *29*, (1932): 937-938.

[15]Emmons, C. W.: Isolation of *Histoplasma Capsulatum* from Soil. Pub. Health Rep., *64*, (1949): 892-896.

[16]Ajello, L., and Runyon, L. C.: Infection of Mice with Single Spores of *Histoplasma Capsulatum*. J. Bact., *66*, (1953): 34-40.

[17]Egeberg, R. O., and Ely, A. F.: *Coccidioides Immitis* in the Soil of the Southern San Joaquin Valley in "Therapy of Fungus Diseases." An International Symposium. Little, Brown, and Co., Boston, 1955.

[18]Emmons, C. W.: Isolation of Coccidioides from Soil and Rodents. Pub. Health Rep., *57*, (1942): 109-111.

[19]Zeidberg, L. D., Ajello, L., Dillon, A., and Runyon, L. C.: Isolation of *Histoplasma Capsulatum* from Soil. Am. J. Pub. Health., *42*, (1952): 930-935.

[20]Zeidberg, L. D., and Ajello, L.: Environmental Factors Influencing the Occurrence of *Histoplasma Capsulatum* and *Microsporum Gypseum* in Soil. J. Bact., *68*, (1954): 156-159.

[21]Lazarus, A. S., and Ajello, L.: Aislamiento de *Histoplasma Capsulatum* del suelo de una cueva en el Peru. Rev. Med. Exptl. Lima, *9*, (1955): 5-15.

[22]Merriam, C. H.: Life Zones and Crop Zones of the United States. U.S.D.A., Div. Biol. Surveys, Bull. No. 10, (1898): 1-79.

Editorial

Veterinarians in Medical Research

Of general as well as historical interest to veterinarians is an article in the *Annual Review of Physiology* (vol. 17, 1955) by Frank C. Mann, M.D., describing the development of the laboratory of experimental surgery and pathology at the Mayo Clinic, Rochester, Minn., under his supervision.

Starting in 1914, he relates how group research was developed. A group of scientists, trained in research in different fields, was assembled. They participated as equals, on a voluntary basis, devoting a limited time to the group research so that each could continue investigations in his own field. Of interest is the statement: "The nebulous honor of having his name first on the published paper was granted as an inducement for the member of the team who would do the greatly disliked task of preparing the manuscript." However, each scientist approved his own contribution before publication.

Also of interest is the reference to the first participating veterinarian. Dr. Mann stated that "one of the most vexing problems . . . [was] related to the procurement, housing, and care of laboratory animals." Since one of the main difficulties was the prevalence of disease, it was decided that the solution lay in adding a veterinarian to the research staff. As a result, the late Dr. S. D. Brimhall (UP '89) joined the staff in September, 1915. (He retired in 1922.) This was believed to be the first time a veterinarian had become a member of a medical research laboratory staff and was a "happy solution to our animal problems."

Dr. Mann reports that "It soon became evident that our veterinary colleagues had much more to give us than just their knowledge and skill in the care of animals. They possessed a type of training which included knowledge of special differences in both function and disease, and the all-important necessity for observation [animals can't talk] which was of value."

He mentions the rapid progress in veterinary practice which has kept pace with medical practice and adds, "The faculties of veterinary schools include many worthy scientists and the physiology departments . . . are potentially important for researches in comparative physiology, a field which once flourished but has suffered from neglect."

With regard to research in general, Dr. Mann concludes that "It is possible that security is not the most desirable objective in life, . . . that doing what one desires most to do is probably the most important single factor to consider in the selection of a career."

Practical Field Research

Reference is made to two pertinent remarks by Dr. Mann in the above article: to the new idea of doing research "as equals on a voluntary basis" and the importance of "doing what one desires most to do."

In veterinary medicine, as doubtless in all fields, there is great need for just such "voluntary" research by those who feel an urge for "doing" it, and this does not mean laboratory research only.

Unfortunately, the word *research* is too often identified with a test tube or a microscope. Webster defines it as "careful search" or "studious inquiry."

Important and essential as laboratory research is, it alone may have little value unless properly related to field conditions. Likewise, opinions derived in field studies by practitioners may get on the wrong track if details are not properly confirmed by the laboratory. For solid progress, the two should be coordinated on an "equal and voluntary basis." There is a gratifying trend in this direction. However, practitioners of long experience are too seldom found participating.

The old reliables who had to depend, in diagnosing, on thoroughness in knowledge of animals and their own ability to observe and analyze, often developed a know-how which will seldom be attained by those who lean heavily on laboratory techniques. This makes the opinions of the former group doubly valuable when supported by laboratory findings.

As an example, many practitioners have long considered actinomycosis and actinobacillosis as quite readily distinguishable diseases, and they assumed that pathologists agreed. However, the latest American texts avoid a distinct differentiation.

This emphasizes the value of research findings reported in an article in this issue (p. 478). It seems to confirm the observation that not only is actinobacillosis a distinct disease but that it also is transferable, which was previously denied.

Practitioners should take advantage of their unique opportunity for teamwork in practical surgery, and should report it.

ABSTRACTS

Reactions Between Leptospira Species

Leptospira icterohaemorrhagiae (AB) agglutinins and lysins which developed titers for the infecting microorganism were found in 183 serums from 219 cattle naturally infected with *Leptospira pomona*. In general, the homologous or *L. pomona* titer exceeded the heterologous or *L. icterohaemorrhagiae* titer. Two of 156 cattle were found to have heterologous titers but a homologous reaction was absent. Heterologous serotype titers were not detectable in the serums of all cattle with demonstrable *L. pomona* titers.

The cross-agglutination reaction was also observed in the serums of guinea pigs and hamsters which were inoculated with *L. pomona*-infected material.

Cattle, swine, and a goat concurrently developed serum titers for the two serotypes during the experimental *L. pomona* infection. Titers persisted for both leptospiral species for 48 days, at which time the experiments were concluded.

When the serums of the cattle, which were experimentally infected with *L. pomona*, were absorbed with *L. icterohaemorrhagiae* (AB), all reactivity for *L. icterohaemorrhagiae* was removed and that for *L. pomona* was decreased. Evidence indicated that *L. pomona* (Wickard), which had been propagated in mediums for over two years, may have undergone a minute antigenic change.

The implications of these findings with respect to the serodiagnosis of leptospiroses are discussed. —[*E. V. Morse and V. Allen: Serological Cross-Agglutination Reactions Between Leptospira Pomona and Leptospira Icterohaemorrhagiae, AB. Am. J. Vet. Res., 17, (July, 1956): 563.*]

Abscesses of the Pharyngeal Region of Swine

An unnamed Streptococcus sp. of Lancefield's group E was isolated from 85.6 per cent of 492 abscesses of the pharyngeal region of swine. The incidence of this bacterium was determined on culture of specimens from Ohio, Illinois, and Minnesota and was similar to that obtained from like specimens collected in Iowa. Other kinds of bacteria that may be associated with this type of lesion are believed to be secondary invaders.

It was concluded that the group E Streptococcus is worthy of consideration as the etiological agent of this condition because of its regular association with the abscesses.—[*J. R. Collier: Abscesses of the Pharyngeal Region of Swine—Bacteriological Examination of Exudates. Am. J. Vet. Res., 17, (Oct., 1956): 640-642.*]

Diphtheroid Stomatitis of Chickens

Chickens (Rhode Island Red, White Leghorn, White Plymouth Rock) were seen with yellowish white, rather firm, adherent diphtheritic lesions in the mouth and pharynx. The lesions and the salivary glands contained large numbers of a spiral organism, 5 to 12μ long and 1μ wide, usually with three to six spirals. The organism was actively motile by means of a single flagellum at each end. Giemsa-stained organisms were less acutely spiral and contained dark purple-stained round areas, about one per coil, contrasting with a gray or light blue color of the rest of the cell. Heat-fixed, gram-stained organisms were also uneven in color, being mostly pink with unstained and purple areas.

Culture attempts in artificial mediums and in embryonating eggs were unsuccessful because of overgrowth with other organisms. Transfer of the organisms and production of lesions was effected by contact and by oral inoculation of material containing the spirilla. The paper reviews some of the previous reports of spiral organisms in birds. The name "*Spirillum pulli*, species nova," is proposed for this organism.—[*William J. Mathey, Jr.: A Diphtheroid Stomatitis of Chickens Apparently Due to a Spirillum. Am. J. Vet. Res., 17, (Oct., 1956): 742-746.*]

Submucosal Glands in the Bovine Colon

Two areas of mucosal thickening are regularly encountered in the bovine colon at the ileocecal valve and at the junction of the proximal and coiled loops of the ascending colon. These thickenings are caused by Peyer's patch-like accumulations of lymphoid tissue. The mucosal glands in these areas penetrate into the submucosa, apparently as a result of defects in the muscularis mucosae.

Cystic, crypt abscessing changes are frequent in these areas, particularly in the submucosal glands. This type of lesion is considered specific for the particular structures and not for any particular disease entity.—[*James R. Rooney, II: Submucosal Glands in the Bovine Colon. Am. J. Vet. Res., 17, (Oct., 1956): 599-606.*]

BOOKS AND REPORTS

Annual Review of Biochemistry

The twenty-fifth edition of the "Annual Review of Biochemistry" includes 24 chapters written by experts in the various fields. Its subjects range from nonoxidative and nonproteolytic enzymes to carbohydrate metabolism. It is too technical for other than research workers.—[*Annual Review of Biochemistry. J. Murray Luck, Frank W. Allen, and Gordon MacKinney, editors. 794 pages. Annual Reviews, Inc., Palo Alto, Calif. 1956. Price $7.00.*]

Dictionary of Dietetics

This book is a compilation of words and terms, and their definitions, which are commonly used in relation to diet and diet therapy. The author has included terms from the fields of nutrition, medicine, chemistry, and biochemistry in order to provide as complete a background as possible for the feeding problems of healthy as well as ill persons, the young as well as the aged.—[*Dictionary of Dietetics. By Rhoda Ellis. 152 pages. Philosophical Library, Inc., New York, N. Y. 1956. Price $6.00.*]

Veterinarians Invited to Attend A.A.A.S. Symposium

A feature of the Section O (Agriculture) program of the American Association for the Advancement of Science meetings in New York City, Dec. 26-31, 1956, will be a symposium on "Grasslands in Our National Life." Several of the papers to be presented will be of interest to veterinarians, especially those in the field of nutrition.

Among the topics to be discussed by leading authorities are forage utilization and related animal nutrition problems, estrogenic substances in forages, different methods of utilizing forage in dairy cattle nutrition, and mineral problems in forage utilization.

The AVMA is participating as a co-sponsor of the Symposium along with other scientific and professional societies which have representation in A.A.A.S.

Veterinarians who want more information about the program should write to Dr. Howard B. Sprague, Chairman, Section O, A.A.A.S., Pennsylvania State University, University Park, Pa.

U. S. GOVERNMENT

Dr. Burmester Awarded Tom Newman Award.—Dr. B. R. Burmester, Regional Poultry Research Laboratory, U.S.D.A., East Lansing, Mich., was awarded the Tom Newman Memorial Award by the Poultry Association of Great Britain for his research on visceral lymphomatosis of chickens published in 1955.

The Tom Newman Memorial Award is an international award for poultry husbandry research and is made annually to the author "of the most important contribution in poultry husbandry research published the previous year. . . ."

Born in Petaluma, Calif., Dr. Burmester received the B.S. degree in poultry husbandry, the M.A. and Ph.D. degrees in comparative physiology from the University of California, and the D.V.M. degree from Michigan State University. At the University of California, and later at the University of Illinois, he served as an instructor in poultry husbandry and did research on the physiology of reproduction. In 1940, he joined the U. S. Regional Poultry Research Laboratory where he now conducts research on avian lymphomatosis and related diseases.

In 1940, Dr. Burmester received the Poultry Science Research Award and, in 1948, the Sigma Xi Junior Research Award. He is a member of the Poultry Science Association, American Association for Cancer Research, Society of Experimental Biology and Medicine, the World's Poultry Science Association, the Official Conference of Research Workers in Animal Diseases of North America, and the AVMA.

Dr. Johnstone, Active Veterinarian, 80 Years Old.—Dr. Alexander G. Johnstone, still active as a meat inspector for the U.S.D.A., San Francisco, Calif., branch, was 80 years old on Sept. 4, 1956.

Dr. Alexander G. Johnstone

Born in Ontario, Dr. Johnstone became a naturalized citizen of the United States in 1900, and received the D.V.M. degree from Chicago Veterinary College in 1915. He was with the Federal Meat Inspection Branch in Chicago from 1917 until his retirement in 1938. During World War II, Dr. Johnstone was again employed by the U.S.D.A. and was assigned to meat inspection in Fort Worth, Texas. Since then, he has been assigned to Los Angeles, Calif., Smithfield, Va., Sandusky, Ohio and, finally, San Francisco.

Although the age of retirement for civil service employees is 70, the Meat Inspection Branch, because it has been unable to secure the number of veterinarians needed to provide adequate service, has obtained authority to employ older persons.

s/C. H. Pals.

• • •

Veterinary Personnel Changes.—The following changes in the force of veterinarians employed by the U. S. Department of Agriculture are reported as of Sept. 30, 1956.

TRANSFERS

George E. Aidman, from Frankfort, Ind., to Rapid City, S. Dak.

Paul C. Becton, from Little Rock, Ark., to Baton Rouge, La.

Don R. Bowers, from Charleston, W. Va., to Jackson, Miss.

Fred W. Cardwell, from Smithfield, Va., to Albany, N.Y.

Salvatore Corridore, from New York, N.Y., to N. Walpole, N.H.

Edmund F. Cushing, from Olympia, Wash., to Reno, Nev.
Frank T. Custer, Jr., from Columbus, Ohio, to Alexandria Bay, N.Y.
Irvin A. Darling, from Worthington, Minn., to Oxford, Neb.
Orville H. Drumm, from Boston, Mass., to Derry, N.H.
Clement M. Flowers, from Lakewood, N.J., to Monroe, N. Car.
Salvatore C. Greco, from Montpelier, Vt., to Albany, N.Y.
Woodrow W. Harkins, from Phoenix, Ariz., to Lansing, Mich.
George Harner, from Springdale, Ark., to St. Louis, Mo.
Harold C. King, from Des Moines, Iowa, to Washington, D.C.
Erik Kjarulff, Camden, N.J., to Eastport, L.I., N.Y.
Peter Kluniak, from Cordova, Md., to Shelbina, Mo.
William A. McDonald, from Sacramento, Calif., to Little Rock, Ark.
Milton A. Nevens, from Camden, N.J., to Winchester, Va.
Robert J. Reigh, from Little Rock, Ark., to Indianapolis, Ind.
Henry Tillett, from Camden, N.J., to Worthington, Minn.
Robert L. Ziriax, Jr., from Albuquerque, N. M., to Trenton, N.J.

RETIREMENTS

William A. Cornell, Omaha, Neb.
Earnest R. Teich, Bismarck, N. Dak.
Robert C. Thumann, Columbus, Ohio.

AMONG THE STATES AND PROVINCES

California

East Bay Association.—A meeting of the East Bay Veterinary Medical Association was held on Aug. 29, 1956, at the hospital of Dr. I. M. Roberts, Oakland, Calif. The principal subject under discussion was the constitution which is being revised.

On Sept. 26, 1956, the Association held its meeting at the Robin Hood Inn. Among the subjects discussed were a short course for graduate veterinarians, membership, and the constitution.

s/L. S. GOLDSTON, *Secretary.*

Illinois

Illinois Conference.—The thirty-seventh annual Illinois conference and extension short course for veterinarians was held on Oct. 12, 1956, at the University of Illinois, College of Veterinary Medicine, Champaign.

The following guest speakers and their subjects participated in the program: H. S. Bryan, Upjohn Company, Kalamazoo, Mich. (leptospirosis); J. H. Nadler, Peotone, Ill. (surgical correction of self-nursing); V. G. Crago, Youngstown, Ohio (small animal hospitals, clinical tips); William G. Huber, Cissna Park, Ill. (poultry practice tips); G. T. Edds, Fort Dodge Laboratories, Fort Dodge, Iowa (new treatments for old diseases); and M. A. Emmerson, Iowa State College, Ames (reproduction research).

The program also included the following staff members and their subjects: A. O. Griffiths and A. G. Schiller (clinical tips); B. F. Trum (radioactive fall out); J. R. Pickard (diagnostic laboratory of the state department of agriculture and the college of veterinary medicine); D. Maksic (hip injuries); P. D. Beamer (mucosal disease complex); R. J. Brown and T. N. Phillips (grooving the hoof); M. E. Mansfield (parasite control); and H. J. Hardenbrook and L. E. Hanson narrated television demonstrations.

s/L. E. BOLEY, *Chairman.*

Iowa

East Central Association.—A meeting of the East Central Iowa Veterinary Medical Society was held at the Hotel Roosevelt, Cedar Rapids, on Sept. 13, 1956.

The following speakers and their subjects were among the program participants: Leroy A. Pierce, Cedar Rapids (bovine tuberculosis and brucellosis cooperative testing); John B. Bryant, Mount Vernon (visit to Colorado A. & M. College); and William S. Monlux, Iowa State College, Ames (parasites).

s/GUY S. JONES, *Secretary.*

New Jersey

Metropolitan Association.—At the Oct. 17, 1956, meeting of the Metropolitan New Jersey Veterinary Medical Association held at the Academy of Medicine Building, Newark, Dr. David K. Detweiler, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, discussed diagnosis and therapy of canine cardiac diseases.

s/MYRON S. ARLEIN, *Secretary.*

DEATHS

Clarence R. Richards (ONT '01; CVC '02), 70, Los Angeles, Calif., died on Dec. 20, 1950. For 46 years, Dr. Richards had specialized in equine practice.

Forrest E. Richards (ARK '18), 63, Bonham, Texas, died on Aug. 10, 1956. Dr. Richards was a general practitioner. His survivors include his widow, a son, three brothers, and three sisters.

Robert Simms (COR '11), 69, Morristown, N. J., died on Feb. 17, 1954, in Carmel, Calif. Dr. Simms had been a lieutenant in the Veterinary Corps of the U. S. Army during World War I and had been a member of the New Jersey Veterinary Medical Association. His widow and children survive.

• • •

Other Deaths Reported.—The following deaths have been reported. The usual information for an obituary was not supplied.

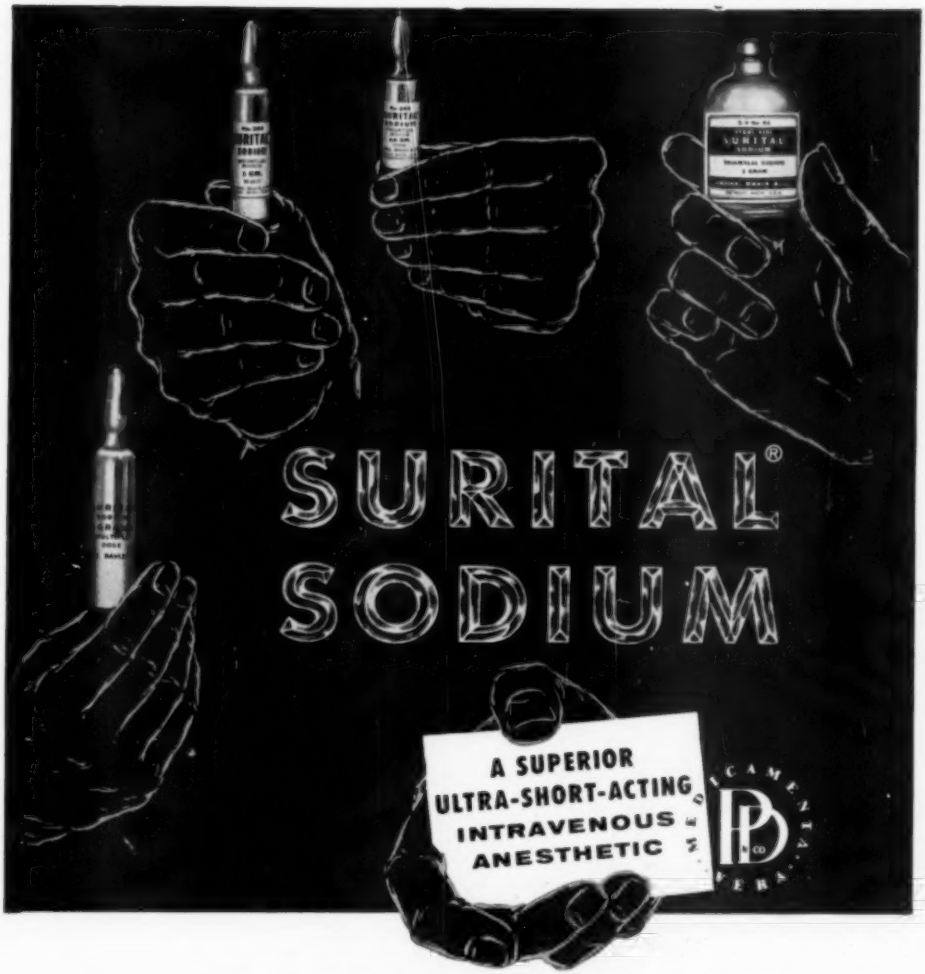
Edmund Mackey (CVC '06), Princeton, Minn.

Noah L. Life (GR '06), Weston, W. Va.

George H. Hebert (MON '18), St. Georges, Que.

O. G. Olsen (MCK '10), Marinette, Wis.

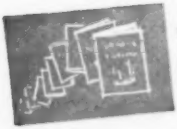
C. W. Sutherland (CVC '11), Kinston, Ala.



The use of SURITAL in animals has shown that induction is smooth and rapid and is free of excitement or irritability or undesirable side reactions.

SURITAL SODIUM (THIAMYLAL SODIUM, PARKE-DAVIS) IS SUPPLIED:

0.2 Gm., 0.3 Gm., 0.5 Gm., 1.0 Gm., 5.0 Gm., and 10.0 Gm. ampoules (Nos. 261, 262, 263, 264, 265, 266); 0.5 Gm. and 1.0 Gm. ampoules with ampoules of Water for Injection, U.S.P.; 1.0 Gm., Steri-Vials (No. 64) (rubber-diaphragm-capped vials); 1.0 Gm. Steri-Vials with ampoules of Water for Injection, U.S.P.



PROFESSIONAL LITERATURE AVAILABLE ON REQUEST

Department of Veterinary Medicine

PARKE, DAVIS & COMPANY

DETROIT 32, MICHIGAN

ORGANIZATION SECTION

WOMEN'S AUXILIARY

President—Mrs. A. E. Coombs, P.O. Box 174, Skowhegan, Maine.
Secretary—Mrs. F. R. Booth, 3920 E. Jackson Blvd., Elkhart, Ind.

The International Women's Auxiliary to the Veterinary Profession Continues to Grow.—Our dreams have come true in the development and advancement in the program of the International Women's Auxiliary to the Veterinary Profession. In all the countries where the program has been started, it has progressed with great enthusiasm. The one fine thing is that it has been effective in many countries where, up to now, women have taken little hand in such affairs. Had it not been for outstanding veterinarians in these countries, who have had a broader experience than the average, this would have come about in a slower fashion. But in all countries, there are outstanding men of our profession who recognize the fine influence of women and they have been a wonderful help to us.

Not only have our auxiliary groups promoted many fine programs to advance the standing of veterinary medicine, but they have branched out into civic affairs to bring their women into a most favorable light in their communities. Many notices have been made of these things in their local press.

There is a fine spirit of friendship and great cooperation in the work of the officers who are helping the women with their plans. It is helping to break down international barriers, and we are proud that the veterinary profession is taking a lead in bringing about their fine effect through their wives.

Many of the countries are not only carrying on a favorable program but they are also editing bulletins filled with their activities, plans, and successes. They are filled with enthusiasm at being a part of this great family of veterinary wives and women associates. We feel that we owe this interest to the Women's Auxiliary to the AVMA for giving others the idea of what an advantage this bulletin can be. Peru, Chile, Argentina, Uruguay, Brazil, France, Spain, and the Scandinavian countries have pages devoted to the work of women in their papers. We are very proud of this way of reaching women. Plans are being started for the next International Congress, although nothing has been settled as yet. But the women will be on hand to carry out their part of the program necessary to bring about a fine relationship.

s/Dr. Virginia Buff D'Apice, *President, International Women's Auxiliary to the Veterinary Profession.*

• • •

Auxiliary Membership Passes 5,000 Mark in 1956.—History-wise, the Women's Auxiliary to the AVMA set a new record in total membership during the fiscal year 1955-1956, the 5,000 mark having been passed. This fortieth year of the Women's Auxiliary has been one of the busiest in its history.

The members were pleased to have the Auxiliary house of representatives vote at their 1955 meeting to make the "dues year" the calendar year, effective with January, 1956.

The historian made a record in the form of a scrap book of pertinent material relating to this year of growth, which was on display at the San Antonio meeting in October, and which created considerable interest.

s/(Mrs. V. H.) Florence Miller, *Historian.*

• • •

Eastern Iowa Auxiliary.—The Women's Auxiliary to the Eastern Iowa Veterinary Association held its annual meeting on Oct. 4-5, 1956, at the Hotel Sheraton Montrose, Cedar Rapids, Iowa, in conjunction with the forty-third meeting of the Eastern Iowa Veterinary Association.

The women's program included a business meeting, luncheon, and a breakfast and style show.

s/Mrs. J. M. Barclay, *Secretary.*

Now... Talk through noise

NEW TRANSISTORIZED **POWER VOICE** speaker

The secret is in the exclusive **"GOLDEN HEART"** *transistor*

Hear your mobile radio

HUNDREDS OF FEET AWAY

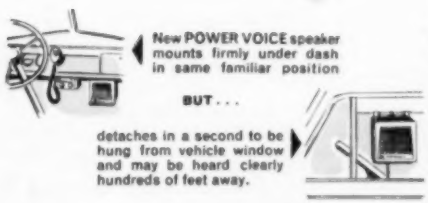
Now your vehicles, in fact any mobile radio equipped vehicle, can get far greater volume than ever before, with the new Motorola transistorized Power Voice Speaker.

This new compact, inexpensive speaker-amplifier combination delivers 10 TIMES MORE POWER than the conventional passive speaker. No more straining to hear messages. Just turn it up—it's got all the volume you'll *ever* need, all in this one small package. No longer is your driver shackled inside his vehicle...he can move about freely, hundreds of feet away, and still hear his dispatcher.

Secret of Motorola's newest development is the built-in transistorized amplifier, utilizing two long-life, Motorola power transistors. With the average 12 volt mobile radio system, the new speaker develops *15 watts* audio output. Even on a 6 volt system, you get 5 watts output—*much* more than the conventional one watt speaker level.

This power packed speaker is available for your mobile 2-way radio NOW. It can be quickly and easily added to most 6 or 12 volt installations. With the new Power Voice Speakers doing a bigger, better job for you, you'll also find low battery drain, bandpass response that accents voice frequencies, and versatile Quick-detach mounting...in a compact, all-metal housing.

You must *hear* the new Power Voice Speaker to appreciate what this added power can mean to you. Write, phone or wire today...or mail the coupon below.



MOTOROLA...always FIRST with the NEWEST in TRANSISTORIZED EQUIPMENT

MOTOROLA
2-WAY RADIO

MAIL THIS COUPON FOR LITERATURE
or a demonstration

Motorola Communications & Electronics, Inc., Dept. 31
4501 Augusta Blvd., Chicago 51, Ill.

☐ Please send me more information on the new Power Voice Speaker.

☐ I want to hear a demonstration of the Power Voice Speaker.

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

AVMA Official Roster, 1956-1957

Officers

President—Wayne O. Kester, Veterinary Service, Office of the Surgeon General, Department of Air Force, Washington 25, D.C.
President-Elect—W. W. Armistead, School of Veterinary Medicine, Texas A. & M. College, College Station, Texas.
Executive Secretary—J. G. Hardenbergh, 600 S. Michigan Ave., Chicago 5, Ill.
Assistant Executive Secretary—H. E. Kingman, Jr., 600 S. Michigan Ave., Chicago 5, Ill.
Treasurer—H. E. Kingman, Jr., ibid.

Vice-Presidents

Zone 1—K. Maynard Curts, 5236 Delmar Ave., Kansas City, Kan.
Zone 2—Mark W. Allam, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa.
Zone 3—Kenneth Whittington, 769 Vance Ave., Memphis, Tenn.
Zone 4—C. U. Duckworth, 828 Euclid Ave., Berkeley, Calif.
At Large—M. D. Baum, State Department of Public Health, State Office Building, Denver 2, Colo.

Board of Governors*

Chairman—T. Lloyd Jones; Wayne O. Kester; W. W. Armistead.

Executive Board

Chairman—T. Lloyd Jones, Ontario Veterinary College, Guelph, Ont.
1st District—T. Lloyd Jones, ibid. (1957).
2nd District—S. F. Scheidy, 943 Turner Ave., Drexel Hill, Pa. (1958).
3rd District—L. M. Hutchings, Department of Veterinary Science, Purdue University, Lafayette, Ind. (1958).
4th District—R. S. Sugg, 408 Magnolia Ave., Auburn, Ala. (1959).
5th District—F. B. Young, P.O. Box 6, Waukee, Iowa (1960).
6th District—Joseph M. Arburua, 3020-26th Ave., San Francisco, Calif. (1961).
7th District—E. C. Stone, College of Veterinary Medicine, State College of Washington, Pullman, Wash. (1960).
8th District—Dan J. Anderson, Rt. 1, Box 123, Smithfield, Texas (1961).
9th District—Edwin Laitinen, 34 Cliffmore Rd., West Hartford, Conn. (1957).
10th District—Wade O. Brinker, College of Veterinary Medicine, Michigan State University, East Lansing, Mich. (1959).
Ex officio—Wayne O. Kester, Veterinary Service, Office of the Surgeon General, Department of the Air Force, Washington 25, D.C. (1958).
Ex officio—W. W. Armistead, School of Veterinary Medicine, Texas A. & M. College, College Station, Texas (1959).
Ex officio—Floyd Cross, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo. (1957).

Advisory Committee of the House of Representatives

Chairman—W. T. Oglesby, Department of Veterinary Science, University of Louisiana, Baton Rouge 3, La.
Representing Large Animal Practice—M. R. Blackstock, 157 W. Hampton Ave., Spartanburg, S. Car. (1957).
Representing Large Animal Practice—P. G. MacKintosh, P. O. Box 856, Yakima, Wash. (1959).
Representing Mixed Practice—Niel Pieper, Randolph Rd., Middletown, Conn. (1959).
Representing Small Animal Practice—J. O. Knowles, 2936 N.W. 17th St., Miami 42, Fla. (1958).
Representing Teaching and Research—W. T. Oglesby, ibid. (1958).
Representing Federal or State Government Regulatory Services—A. P. Schneider, 2025 N. 23rd St., Boise, Idaho (1959).
Representing the Armed Forces and the U. S. Public Health Service—Elmer W. Young, Office of the Surgeon General, Main Navy Bldg., Rm. 2064, 18th and Constitution Ave., N.W., Washington 25, D. C.

Headquarters Staff

Executive Secretary—J. G. Hardenbergh, V.M.D.
Assistant Executive Secretary and Director of Professional Relations—H. E. Kingman, Jr., D.V.M.
Editor-in-Chief—W. A. Aitken, D.V.M.
Director of Membership Services and Public Information—R. G. Rongren.
Public Information Department—Brian M. Forster.
Directory Department—Mary B. Sanem.
Applications and Dues—Carrie Kish.
Circulation Department—Robert R. Schmitt and John T. Altiery.
Subscriptions—Vanona K. Vanden Brock.
Receptionist—Josephine Freund.
Librarian—Gertrude D. Schwerin.
Financial Secretary and Secretary to Dr. Hardenbergh—Rosalyn Zirlin.
Secretary to Dr. Kingman—Dorothy Larmour.
Secretary to Dr. Aitken—Ann Mahon.
Secretary to Mr. Rongren—Kathleen Bortkewicz.

Editorial Staff

Editor-in-Chief—W. A. Aitken.
Managing Editor—J. G. Hardenbergh.
Editor, Small Animal Medicine—Wayne H. Riser, D.V.M.
Assistant Editor—Helen S. Bayless.
Advertising Manager—Helen S. Bayless.
Assistant to the Editor—Eva G. Bailey.
Editorial Assistant—Helen V. Emerson.
Editorial Assistant—Bess Lukas.
Editorial Assistant—Karen Epstein.

Washington Office

J. A. McCallam, V.M.D. (Brig. Gen., Ret.), Rm. 109, 1507 "M" St., N.W., Washington 5, D.C. Telephone: NOrth 7-0881.

Associate Editors

Paul Meginnis, Diseases of Horses, R.R. 1, Roselle, Ill.
S. J. Roberts, Diseases of Dairy Cattle, New York State Veterinary College, Ithaca, N.Y.
Harry W. Johnson, Diseases of Beef Cattle, 5000 S. Santa Fe St., Littleton, Colo.
J. D. Ray, Diseases of Swine, White Hall, Ill.
Hadleigh Marsh, Diseases of Sheep and Goats, Blackstone Apts., Helena, Mont.
Henry Van Rockel, Diseases of Poultry, Department of Veterinary Science, University of Massachusetts, Amherst, Mass.
K. W. Smith, Diseases of Small Animals, 1002 34th St., Sioux City, Iowa.
L. E. Fisher, Diseases of Wildlife and Captive Animals, 2823 S. Harlem Ave., Berwyn, Ill.
W. T. S. Thorp, Diseases of Laboratory Animals, School of Veterinary Medicine, University of Minnesota, St. Paul 1, Minn.
B. T. Simms, Agricultural Research Service, U.S.D.A. Washington 25, D.C.
Raymond Fagan, Public Health Services, 11 Locust St., Goshen Heights, West Chester, Pa.
Elmer W. Young, Veterinary Corps, Military Services, Veterinary Division, Office of the Surgeon General, De-

*The Board of Governors is also, ex officio, the Committee on Journal for the Association's publications.

partment of the Army, Main Navy Bldg., Washington 26, D.C.

Section Officers

(These officers also constitute the Committee on Program with the executive secretary or assistant executive secretary of the AVMA as chairman, ex officio.)

General Practice.—Rolland Anderson, Chairman, 223 N. Wisconsin St., Elkhorn, Wis.; Curtis W. Cromley, Secretary, 250 E. Main St., Ashville, Ohio.

Research.—R. A. Packer, Chairman, Department of Veterinary Hygiene, Iowa State College, Ames, Iowa; William D. Pounden, Secretary, Department of Veterinary Science, Agricultural Experiment Station, Wooster, Ohio.

Small Animals.—K. W. Smith, Chairman, 1002 34th St., Sioux City, Iowa; R. J. Beamer, Secretary, School of Veterinary Medicine, Texas A. & M. College, College Station, Texas.

Poultry.—L. C. Grumbles, Chairman, 504 Kyle St., College Station, Texas; P. P. Levine, Secretary, New York State Veterinary College, Ithaca, N.Y.

Surgery and Obstetrics.—Fred C. Neal, Chairman, School of Veterinary Medicine, Texas A. & M. College, College Station, Texas; William F. Riley, Jr., Secretary, College of Veterinary Medicine, Michigan State University, East Lansing, Mich.

Public Health.—John H. Helwig, Chairman, 2382 Brixton Rd., Columbus 21, Ohio; Neil G. MacEachern, Secretary, Base Veterinarian, Maxwell Air Force Base, Ala.

Women's Auxiliary

Mrs. A. E. Coombs, President, P.O. Box 174, Skowhegan, Maine.

Mrs. L. H. Moe, President-Elect, 1814 W. Third Ave., Stillwater, Okla.

Mrs. E. A. Woelffer, 1st Vice-President, 115 Woodland Lane, Oconomowoc, Wis.

Mrs. E. E. Leasure, 2nd Vice-President, Manhattan, Kan.

Mrs. James Cornwell, 3rd Vice-President, 65 Beverly Rd., Beverly Hills, Asheville, N. Car.

Mrs. Frank R. Booth, Secretary, 3920 E. Jackson Blvd., Elkhart, Ind.

Mrs. C. M. Rodgers, Membership Secretary, P.O. Drawer G, Blandinsville, Ill.

Mrs. J. D. Stevens, Treasurer, P.O. Box 395, Sequim, Wash.

Mrs. Tom S. Maddox, Recorder, 109 S. Cherry St., Greenville, Ky.

Standing Committees

Awards
(Ex Officio)

Wayne O. Kester, as President of the AVMA, Veterinary Service, Office of the Surgeon General, Department of Air Force, Washington 25, D.C.

W. W. Armistead, as President-Elect of the AVMA, School of Veterinary Medicine, Texas A. & M. College, College Station, Texas.

T. Lloyd Jones, as Executive Board Chairman of the AVMA, Ontario Veterinary College, Guelph, Ont.

Kenneth F. Wells, as Veterinary Director General of Canada, Health of Animals Division, Department of Agriculture, Ottawa, Ont.

W. A. Hagan, as AVMA Representative to Division of Medical Sciences, National Research Council, New York State Veterinary College, Ithaca, N.Y.

Elmer W. Young, as Chief of the Veterinary Division, Office of the Surgeon General, Department of the Army, Washington 25, D.C.

M. R. Clarkson, as Deputy Administrator of Agricultural Research Service, U.S.D.A., Washington 25, D.C.

Biological Products

Carl J. Norden, Jr., Chairman, Norden Laboratories, Lincoln, Neb. (1959).

Irving G. Cashell, 2916 "M" St., N.W., Washington 7, D.C. (1959).

A. L. Brueckner, 4111 Colesville Rd., Hyattsville, Md. (1958).

R. P. Jones, Animal Quarantine Branch, Agricultural Research Service, U.S.D.A., Washington 25, D.C. (1957).

Maurice Panisset, Institute of Microbiology and Hygiene, 2900 Blvd. Mont-Royal, Montreal, Que. (1957).

William J. Zontine, 44848 N. Yucca Ave., Lancaster, Calif. (1958).

Board of Trustees—Research Fund
(Ex Officio)

Wayne O. Kester, Chairman, Veterinary Service, Office of the Surgeon General, Department of Air Force, Washington 25, D.C.

W. W. Armistead, School of Veterinary Medicine, Texas A. & M. College, College Station, Texas.

T. Lloyd Jones, Ontario Veterinary College, Guelph, Ont.

J. G. Hardenbergh, 600 S. Michigan Ave., Chicago, Ill.

H. E. Kingman, Jr., 600 S. Michigan Ave., Chicago, Ill.

Budget
(Ex Officio)

Wayne O. Kester, Chairman, Veterinary Service, Office of the Surgeon General, Department of Air Force, Washington 25, D.C.

W. W. Armistead, School of Veterinary Medicine, Texas A. & M. College, College Station, Texas.

T. Lloyd Jones, Ontario Veterinary College, Guelph, Ont.

J. G. Hardenbergh, 600 S. Michigan Ave., Chicago, Ill.

H. E. Kingman, Jr., 600 S. Michigan Ave., Chicago, Ill.

Ethics

F. R. Booth, Chairman, 3920 E. Jackson St., Elkhart, Ind. (1958).

Fred Schell, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala. (1957).

E. L. Taylor, Warrendale Ave., Georgetown, Ky. (1959).

Council on Education
(*Executive Committee of the Council.)

James E. Greene,* Chairman, Representing Clinical Sciences, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala. (1962).

R. E. Rebrassier,* Secretary, Representing Basic Sciences, Veterinary Laboratory, Ohio State University, Columbus 10, Ohio (1960).

I. B. Boughton, Representing Research and Education, School of Veterinary Medicine, Texas A. & M. College, College Station, Texas (1958).

Garth A. Edge, Representing Public Health, Provincial Department of Public Health, Toronto, Ont. (1957).

Col. William E. Jennings, Representing Military Service, Medical Division, Hq. USAREUR, APO 403, New York, N. Y. (1962).

Fred B. Ogilvie, Representing Small Animal Practice, 1110-12 Minnesota Ave., Kansas City 2, Kan. (1960).

Niel W. Pieper,* Representing General Practice, Randolph Rd., Middletown, Conn. (1958).

M. S. Shahan, Representing Government Service, Plum Island Animal Disease Laboratory U.S.D.A., Greenport, L.I., N.Y. (1961).

E. E. Slatter, Representing Large Animal Practice, 205 Prairie St., Danville, Ill. (1959).

Food Hygiene

C. H. Pals, Chairman, Meat Inspection Branch, Agricultural Research Service, U.S.D.A., Washington 25, D.C. (1958).

R. K. Anderson, School of Veterinary Medicine, University of Minnesota, St. Paul, Minn. (1959).

J. W. Cunkelman, Veterinary Division, Research Department, Swift and Company, Chicago, Ill. (1958).

Raymond J. Helvig, Milk and Food Section, U.S.P.H.S., Washington 25, D.C. (1957).

W. M. D. Nettles, Quartermaster Food and Container Institute for the Armed Forces, 1819 West Pershing Rd., Chicago 9, Ill. (1959).

E. J. Rigby, City Health Department, Winnipeg, Man. (1957).

History

J. F. Smithcors, Chairman, College of Veterinary Medicine, Michigan State University, East Lansing, Mich. (1959).
J. M. Arburua, 3020-26th Ave., San Francisco, Calif. (1958).
R. R. Dykstra, School of Veterinary Medicine, Kansas State College, Manhattan, Kan. (1957).
H. P. Hoskins, 2766 Garrison Ave., Evanston, Ill. (1958).
R. S. Mackellar, Sr., 329 W. 12th St., New York 14, N.Y. (1957).
A. H. Quin, P.O. Box 167, Kansas City, Mo. (1959).

Joint Committee on Foods

Louis A. Corwin, Chairman, 136-21 Hillside Ave., Richmond Hill 18, N.Y. (AAHA) (1958).
J. G. Hardenbergh, Secretary, 600 S. Michigan Ave., Chicago 5, Ill. (AVMA) (1961).
C. W. Bower, 1128 Kansas Ave., Topeka, Kan. (AAHA) (1957).
J. B. Engle, P.O. Box 432, Summit, N.J. (AVMA) (1959).
Lloyd C. Moss, Veterinary Hospital, Colorado A. & M. College, Fort Collins, Colo. (1960).

Legislation

C. F. Clark, Chairman, College of Veterinary Medicine, Michigan State University, East Lansing, Mich. (1958).
J. G. Hardenbergh, Secretary, ex officio, 600 S. Michigan Ave., Chicago 5, Ill.
G. H. Gilbert, 5500 Wadsworth St., Arvada, Colo. (1959).
Howard W. Johnson, Animal Disease Station, Beltsville, Md. (1957).
N. J. Miller, P.O. Box 335, Eaton, Colo. (1958).
O. H. Person, 359 N. Linden St., Wahoo, Neb. (1957).
Elmer W. Young, Veterinary Division, Office of the Surgeon General, Department of the Army, Washington 25, D.C. (1958).

Nutrition

William D. Pounden, Chairman, 625 Sunrise View Dr., Wooster, Ohio (1957).
Robert W. Dougherty, New York State Veterinary College, Ithaca, N.Y. (1957).
Raymond T. Hander, Bridwell Hereford Ranch, Windthorst, Texas (1958).
R. E. Lubbehusen, Purina Mills, 835 S. 8th St., St. Louis 2, Mo. (1958).
R. H. Udall, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo. (1957).
C. K. Whitehair, Department of Animal Husbandry, Oklahoma A. & M. College, Stillwater, Okla. (1958).

Parasitology

L. E. Swanson, Chairman, 1325 N.W. 14th Ave., Gainesville, Fla. (1958).
F. R. Koutz, College of Veterinary Medicine, Ohio State University, Columbus 10, Ohio (1959).
Wendell Krull, School of Veterinary Medicine, Oklahoma A. & M. College, Stillwater, Okla. (1957).
Lee Seghetti, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo. (1957).
J. H. Whitlock, New York State Veterinary College, Cornell University, Ithaca, N.Y. (1958).
Rural Bell, School of Veterinary Medicine, Texas A. & M. College, College Station, Texas (1959).

Poultry Diseases

C. D. Lee, Chairman, B-12 Curtiss Hall, Iowa State College, Ames, Iowa (1958).
J. P. Delaplane, School of Veterinary Medicine, Texas A. & M. College, College Station, Texas (1959).
Erwin Jungherr, Department of Animal Diseases, University of Connecticut, Storrs, Conn. (1959).
C. L. Nelson, Jewell, Iowa (1958).
B. S. Pomeroy, 1443 Raymond Ave., St. Paul 8, Minn. (1957).
Frank C. Tucker, Claypool, Ind. (1957).

Program*
(Ex Officio)

This committee is composed of the chairmen and secretaries of the six sections with the executive secretary or assistant executive secretary acting as the chairman (see Section Officers, page 25).

*Pursuant to article XII, section 1, part 4, of the Administrative By-Laws, as amended at the Seventy-Eighth Annual Meeting.

Public Relations

J. R. Pickard, Chairman, St. Joseph, Ill. (1958).
Dan J. Anderson, Rt. 1, Box 123, Smithfield, Texas (1958).
C. E. DeCamp, Pitman-Moore Co., 43 W. 61st St., New York 23, N.Y. (1958).
Kenneth G. McKay, 2086 Veterinary Science Bldg., University of California, Davis, Calif. (1958).
Erven A. Ross, 1553 44th St., N.W., Washington, D.C. (1958).
Myron A. Thom, 959 S. Raymond Ave., Pasadena 2, Calif. (1957).

Registry of Veterinary Pathology
Armed Forces Institute of Pathology

C. L. Davis, Chairman, Bldg. 45, Denver Federal Center, Denver 1, Colo. (1958).
Hugh G. Grady, Scientific Director, American Registry of Pathology, Armed Forces Institute of Pathology, Washington 25, D.C. (consulting member).
T. C. Jones, Armed Forces Institute of Pathology, 7th St. and Independence Ave., S.W., Washington, D.C. (1958).
Charles A. Mitchell, Animal Disease Research Institute, Hull, Que. (1957).
C. C. Morrill, College of Veterinary Medicine, Michigan State University, East Lansing, Mich. (1959).
Marvin Twiehaus, 700 Harris St., Manhattan, Kan. (1957).

Research Council

(Appointments are for three-year terms)

Anatomy and Histology.—Robert Getty, Secretary, Department of Anatomy, Iowa State College, Ames, Iowa (1958).
Bacteriology (Immunology and Biological Therapy).—L. C. Ferguson, Head, Department of Microbiology and Public Health, College of Veterinary Medicine, Michigan State University, East Lansing, Mich. (1959).
Biochemistry and Animal Nutrition.—M. J. Swenson, Department of Physiology, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo. (1959).
Large Animal Medicine.—S. J. Roberts, New York State Veterinary College, Cornell University, Ithaca, N. Y. (1959).
Large Animal Surgery.—A. Gordon Danks, New York State Veterinary College, Cornell University, Ithaca, N. Y. (1957).
Parasitology.—R. D. Turk, School of Veterinary Medicine, Texas A. & M. College, College Station, Texas (1957).
Pathology.—T. Carl Jones, Armed Forces Institute of Pathology, Washington, D. C. (1959).
Physiology and Pharmacology.—D. K. Detweiler, 48 N. Sproul Rd., Broomall, Pa. (1959).
Poultry Pathology.—C. A. Brandly, Chairman, School of Veterinary Medicine, University of Illinois, Urbana, Ill. (1957).
Radiology.—Myron A. Thom, 959 S. Raymond Ave., Pasadena 2, Calif. (1957).
Small Animal Medicine.—Richard L. Ott, 1405 Gary St., Pullman, Wash. (1958).
Small Animal Surgery.—James Archibald, Ontario Veterinary College, Guelph, Ont. (1958).
Veterinary Hygiene.—A. G. Karlson, Mayo Foundation, Rochester, Minn. (1958).
Virology.—C. H. Cunningham, School of Veterinary Medicine, Michigan State University, East Lansing, Mich. (1958).
Member-at-Large.—Burton J. Gray, P.O. Box 797, Fort Dodge, Iowa (1957).

Subcommittee on Veterinary Items, National Formulary Committee

(Ten-year appointments terminating in 1959)

B. F. Alfredson, Chairman, School of Veterinary Medicine, Michigan State University, East Lansing, Mich.
D. K. Detweiler, 48 N. Sproul Rd., Broomall, Pa.
Frank D. Enzie, Agricultural Research Center, U.S.D.A., Beltsville, Md.
L. Meyer Jones, Division of Veterinary Medicine, Iowa State College, Ames, Iowa.
F. J. Kingma, Abbott Laboratories, North Chicago, Ill.
John E. Martin, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa.

Therapeutic Agents

L. Meyer Jones, Chairman, Division of Veterinary Medicine, Iowa State College, Ames, Iowa. (1958).
Anthony R. Bott, 102 Osage Dr., Collinsville, Ill. (1957).
John H. Collins, Food and Drug Administration, Department of Health, Education, and Welfare, Washington 25, D.C. (1959).
D. K. Detweiler, 48 N. Sproul Rd., Broomall, Pa. (1958).
L. A. Gendreau, 143 Wellington St. S., Sherbrooke, Que. (1957).
Roger P. Link, Department of Veterinary Physiology and Pharmacology, College of Veterinary Medicine, University of Illinois, Urbana, Ill. (1959).

Special Committees

Academic Standards Board for Graduates of Foreign Veterinary Colleges

W. T. S. Thorp, Chairman, School of Veterinary Medicine, University of Minnesota, St. Paul 1, Minn.
John D. Gadd, Falls Road, Cockeysville, Md.
Ernest O. Froelich, 11 Edgewood Ave., Albany, N.Y.
William E. Jennings, Medical Division, Hq. USAREUR, APO 403, New York, N.Y.
T. Lloyd Jones, Ontario Veterinary College, Guelph, Ont.
Frantisek Kral, 838 Upland Ave., Upland-Chester, Pa.

Animal Reproduction and Artificial Insemination

David E. Bartlett, Chairman, American Breeders Service, 325 N. Wells St., Chicago 10, Ill.
William H. Dreher, Shawano, Wis.
Myron G. Fincher, 118 Delaware Ave., Ithaca, N.Y.
A. H. Frank, 4100 Roanoke Rd., Hyattsville, Md.
Harold J. Hill, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo.
E. A. Woelffer, 115 Woodland Lane, Oconomowoc, Wis.

Brucellosis

J. L. McAuliff, Chairman, 11 Jewett Ave., Cortland, N.Y.
Hugh S. Cameron, School of Veterinary Medicine, University of California, Davis, Calif.
Francis H. Fox, New York State Veterinary Colllege, Ithaca, N.Y.
A. K. Kuttler, 2357 Sheridan Road, Salt Lake City, Utah.
P. G. MacKintosh, P.O. Box 856, Yakima, Wash.
Leonard A. Rosner, Schumate Chapel Rd., Jefferson City, Mo.
V. D. Stauffer, 5500 Wadsworth Blvd., Arvada, Colo.

Diseases of Wild and Furbearing Animals

John R. Gorham, Chairman, Department of Animal Pathology, College of Veterinary Medicine, State College of Washington, Pullman, Wash.
T. T. Chaddock, Box 51, Bridgeport, Mich.
G. R. Hartsough, New Holstein, Wis.
R. J. Kirk, Fur and Game Experiment Station, University of Manitoba, Fort Garry, Man.
Patricia O'Connor, 97 Board St., Stapleton, Staten Island, N.Y.

Emergency Advisory Committee

W. R. Krill, Chairman, College of Veterinary Medicine, Ohio State University, Columbus, Ohio.
H. E. Kingman, Jr., Secretary, 600 S. Michigan Ave., Chicago 5, Ill.
J. B. Engle, P.O. Box 432, Summit, N. J.
W. R. Hinshaw, 140 Kline Blvd., Frederick, Md.
Frank A. Todd, Agricultural Research Service, U.S.D.A., Washington 25, D.C.
C. D. Van Houweling, Livestock Regulatory Programs, Agricultural Research Service, U.S.D.A., Washington 25, D.C.
Elmer W. Young, Veterinary Division, Office of the Surgeon General, Department of the Army, Main Navy Bldg., Washington 25, D.C.
Ex Officio: Board of Governors.

Humane Act Award

W. A. Young, Chairman, 8344 Beverly Blvd., Hollywood 48, Calif.
George W. Mather, School of Veterinary Medicine, University of Minnesota, St. Paul 1, Minn.
Gerry B. Schnelle, 180 Longwood Ave., Boston, Mass.
Mr. J. J. Shaffer, Advisory Member, 157 W. Grand Ave., Chicago 10, Ill.
A. R. Theobald, 4545 Reading Rd., Cincinnati 29, Ohio.

Laboratory Animals

N. R. Brewer, Chairman, Physiology Bldg., University of Chicago, Chicago 37, Ill.
Jules S. Cass, Kettering Laboratory, College of Medicine, Eden Ave., Cincinnati 19, Ohio.
W. H. Dieterich, Hawaiian Medical Laboratory, APO 957, San Francisco, Calif.
B. D. Fremming, 1877 Saw Mill Run Blvd., Pittsburgh, Pa.
R. J. Flynn, P.O. Box 299, Lemont, Ill.
R. Dale Henthorne, U.S. Naval Radiological Defense Laboratory, San Francisco 24, Calif.

Motion Pictures and Television

C. D. Van Houweling, Chairman, Livestock Regulatory Programs, Agricultural Research Service, U.S.D.A., Washington 25, D.C.
Robert Getty, Division of Veterinary Medicine, Iowa State College, Ames, Iowa.
L. J. Gorman, 1540 Ostrander St., La Grange Park, Ill.
J. Ballantyne, Department of Anatomy, Ontario Veterinary College, Guelph, Ont.
C. L. Nelson, Jewell, Iowa.
Wayne H. Riser, 5335 Touhy Ave., Skokie, Ill.
Wayne D. Shipley, 438 S. Quincy St., Hinsdale, Ill.
Frank A. Todd, Agricultural Research Service, U.S.D.A., Washington 25, D.C.

Nomenclature of Diseases

Carl Olson, Jr., Chairman, Department of Veterinary Science, University of Wisconsin, Madison, Wis.
C. Lawrence Blakely, Angell Memorial Animal Hospital, 180 Longwood Ave., Boston, Mass.
D. H. Clifford, School of Veterinary Medicine, University of Minnesota, St. Paul 1, Minn.
D. E. Jasper, School of Veterinary Medicine, University of California, Davis, Calif.
I. A. Merchant, Division of Veterinary Medicine, Iowa State College, Ames, Iowa.
Peter Olafson, New York State Veterinary College, Ithaca, N. Y.

Public Health and Zoonoses

E. S. Tierkel, Chairman, Communicable Disease Center, U. S. P. H. S., 50 7th St. N.E., Atlanta 5, Ga.
R. W. Menges, Department of Health, Education, and Welfare, Communicable Disease Center, P.O. Box 185, Chamblee, Ga.
I. A. Merchant, Division of Veterinary Medicine, Iowa State College, Ames, Iowa.
Karl R. Reinhard, Arctic Health Research Center, P.O. Box 960, Anchorage, Alaska.
J. H. Steele, Communicable Disease Center, U. S. Public Health Service, 50 7th St. N.E., Atlanta 5, Ga.
Kenneth F. Wells, 506 Piccadilly Ave., Ottawa, Ont.

Standards for Veterinary Hospitals

Kenneth W. Smith, Chairman, 1002 34th St., Sioux City, Iowa.
Charles E. Bild, P.O. Box 127, North West Station, Miami, Fla.
A. F. Hayes, P. O. Box 1703, Billings, Mont.
H. L. Marsh, 521 Billings St., Princeton, Ill.
L. C. Moss, Veterinary Hospital, Colorado A. & M. College, Fort Collins, Colo.

Veterinary Service

I. D. Wilson, Chairman, Virginia Polytechnic Institute, Blacksburg, Va.
H E. Kingman, Jr., Secretary, 600 S. Michigan Ave., Chicago 5, Ill.
F. T. Candlin, 280 Madison St., Denver 6, Colo.
Lewis A. Dykstra, 925 N. Lake St., Aurora, Ill.
E. J. Frick, School of Veterinary Medicine, Kansas State College, Manhattan, Kan.
Warren J. Kilpatrick, Mediapolis, Iowa.
Charles C. Rife, 505 Lindberg Dr., N. E., Atlanta 5, Ga.

Veterinary Supply Problems

F. B. Young, Chairman, Box 6, Waukee, Iowa.
R. O. Anderson, 223 N. Wisconsin St., Elkhorn, Wis.
P. E. Madsen, 336 N. Jefferson St., Sheridan, Wyo.
A. G. Misener, 6448 N. Clark St., Chicago, Ill.
A. H. Quin, P. O. Box 167, Kansas City, Mo.
Kenneth Whittington, 769 Vance Ave., Memphis, Tenn.

Representatives

(Terms are for one year except as shown)

American Association for the Advancement of Science.—Charles K. Whitehair, College of Veterinary Medicine, Michigan State College, East Lansing, Mich.
American Feed Manufacturers Association Council on Nutrition.—William D. Pounden, 625 Sunrise View Dr., Wooster, Ohio.
National Health Council.—J. A. McCallam, Rm. 109, 1507 "M" St., N.W., Washington 5, D.C.
National Research Council (Division of Biology and Agriculture).—E. F. Waller, Department of Animal and Poultry Industry, University of Delaware, Newark, Del. (1957).
National Research Council, Division of Medical Sciences.—W. A. Hagan, New York State Veterinary College, Ithaca, N. Y. (1959).
National Society for Medical Research.—W. T. S. Thorp, School of Veterinary Medicine, University of Minnesota, St. Paul 1, Minn. (1959).
Ralston Purina Research Fellowship Committee.—C. A. Brandly, School of Veterinary Medicine, University of Illinois, Urbana, Ill. (1957).
United States Pharmacopoeial Convention.—D. K. Detweiler, 48 N. Sproul Rd., Broomall, Pa. (1960).

Resident State Secretaries

Alabama.—McKenzie Heath, School of Veterinary Medicine, Alabama Polytechnic Institute, Auburn.
Arizona.—James E. Sharkey, 6021 S. Central Ave., Phoenix.
Arkansas.—W. L. Thomas, 906 Broadway, Little Rock.
California.—E. E. Jones, 714 S. Santa Anita St., San Gabriel.
Colorado.—G. H. Gilbert, 5500 Wadsworth St., Arvada.
Connecticut.—Niel W. Pieper, Randolph Rd., Middletown.
Delaware.—E. F. Waller, Department of Animal and Poultry Industry, University of Delaware, Newark.
District of Columbia.—William C. Patterson, Jr., Animal Disease Station, Beltsville, Md.
Florida.—Stanley C. Wasman, 1929 Purdy Ave., Miami Beach.
Georgia.—Charles C. Rife, 505 Lindberg Dr. N. E., Atlanta 5.
Idaho.—A. P. Schneider, 2025 N. 23rd St., Boise.
Illinois.—C. B. Hostetler, 1385 Whitcomb Ave., Des Plaines.
Indiana.—L. M. Borst, 3315 Shelby St., Indianapolis.
Iowa.—F. B. Young, P.O. Box 6, Waukee.
Kansas.—K. M. Curts, 70 Central Ave., Kansas City.
Kentucky.—T. J. Stearns, 216 Livestock Exchange Bldg., Louisville 6.
Louisiana.—R. B. Lank, Dalrymple Bldg., Louisiana State University, Baton Rouge.
Maine.—Harold L. Chute, Animal Pathology Bldg., University of Maine, Orono.
Maryland.—John D. Gadd, Falls Rd., Cockeysville.
Massachusetts.—L. A. Paquin, P.O. Box 225, Webster.
Michigan.—Clyde Cairy, 3917 Gainsborough Dr., East Lansing.
Minnesota.—Alvin F. Weber, School of Veterinary Medicine, University of Minnesota, St. Paul 1.
Mississippi.—Charles H. Horne, P.O. Box 377, Newton.
Missouri.—A. H. Groth, School of Veterinary Medicine, University of Missouri, Columbia.
Montana.—A. M. Jasmin, Livestock Sanitary Board, Helena.
Nebraska.—Paul L. Matthews, 4688 Poppleton Ave., Omaha.
Nevada.—Edward Records, University of Nevada, Reno.
New Hampshire.—Clarence F. Bent, Stateline-Lowell Rd., Nashua.
New Jersey.—J. R. Porteus, P.O. Box 938, Trenton 5.
New Mexico.—S. W. Wiest, P.O. Box 75, Santa Fe.
New York.—Charles E. Fanslau, 1450 Broadway, New York 18.
North Carolina.—C. W. Young, 203 Depot St., Mocksville.
North Dakota.—Dean E. Flagg, 202 Teton Ave., Bismarck.
Ohio.—Harold F. Groves, 111 E. Kelso Rd., Columbus 2.
Oklahoma.—C. H. Fauks, 3421 N.W., 20th St., Oklahoma City.
Oregon.—Edward L. Holden, P.O. Box 445, Oswego.
Pennsylvania.—Roy D. Hoffman, 325 S. Richard St., Bedford.
Rhode Island.—J. S. Barber, 560 Pleasant St., Pawtucket.
South Carolina.—Frank M. Lee, State Board of Health, Wade Hampton State Office Bldg., Columbia.
South Dakota.—J. L. Noordsy, Marion.
Tennessee.—Hugh Lamb, P.O. Box 550, Athens.
Texas.—L. G. Cloud, 2833 W. 7th St., Fort Worth.
Utah.—Hugh Hurst, 1754 E. 27th St. S., Salt Lake City.
Vermont.—A. E. Janawicz, R.F.D. 2, Montpelier.
Virginia.—Wilson B. Bell, 210 Clay St., Blacksburg.
Washington.—J. L. Ellis, 2022 E. 4th Ave., Olympia.
West Virginia.—Victor H. Miller, Box 5146, Charleston.
Wisconsin.—H. J. O'Connell, 6 West, State Capitol, Madison 2.
Wyoming.—J. F. Ryff, P.O. Box 557, Laramie.

Resident Provincial Secretaries

Alberta.—J. Gordon Anderson, 1016 9th Ave. W., Calgary.
British Columbia.—Gordon L. Davis, P.O. Box 32, Ladner.
Manitoba.—J. M. Isa, Veterinary Laboratory, University of Manitoba, Winnipeg.
New Brunswick.—Julius F. Frank, Division of Animal Pathology, P.O. Box 310, Sackville.
Nova Scotia.—R. McG. Archibald, 400 Prince St., Truro.
Ontario.—W. J. Rumney, Health Center, 74 Hughson St. S., Hamilton.
Quebec.—Roland Filion, Labortorie de Recherches Veterinaires, Saint-Hyacinthe.
Saskatchewan.—J. S. Fulton, University of Saskatchewan, Saskatoon.

Resident Territorial Secretaries

Canal Zone.—Robert G. Matheney, P.O. Box 807, Ancon.
Hawaii.—Wilson M. Pang, 89 Ala Kimo, Honolulu 17.
Puerto Rico.—A. Lopez-Pacheco, P.O. Box 155, Hato Rey.

in avian salmonelloses and protozoal diseases

Extensively used in the field during the past two years,[1,2,3,4] Furoxone now is firmly established as the preferred antimicrobial agent for the *prevention and control* of salmonelloses (fowl typhoid, pullorum and the paratyphoids), histomoniasis, hexamitiasis and synovitis.

Easily administered in the feed, Furoxone combines efficacy and palatability with freedom from toxic reactions.

In bacterial infections, Furoxone Concentrate is used at the prophylactic level of 1.5 oz. to each 100 lbs. of feed and at the curative level of 3 oz. per 100 lbs. In protozoal infections, a prophylactic level of 3 oz. per 100 lbs. feed and a curative level of 4.5 oz. per 100 lbs. feed are recommended.

Available as Furoxone Concentrate Veterinary containing Furoxone 5.88% (5 Gm./3 oz. excipient) in cartons of 3 oz. and 30 oz.

REFERENCES: 1. Blount, W. P.: Vet. Rec. 67:1087 (Dec. 10) 1955. 2. Pate, D. D.: Southeast Vet. 6:22 (Winter) 1955. 3. Smith, H. W.: J. Comp. Path. 65:55 (Jan.) 1955. 4. Titkemeyer, C. W., and Schmittle, S. C.: Abstracts 45th Ann. Meeting Poultry Sc. Ass., Raleigh, N. C., Aug. 7-10, 1956, p. 49.

Available through your Professional Veterinary Distributor.

EATON LABORATORIES, Norwich, New York

Furoxone®

BRAND OF FURAZOLIDONE

ONE OF THE NITROFURANS . . . A NEW CLASS OF ANTIMICROBIALS—NEITHER ANTIBIOTICS NOR SULFONAMIDES

Research Laboratories, Inc. is proud to list these outstanding RL distributors who are selling such products as Sinjex®, Femulgen, Erysin®, Multi-Min, Pasture-Plus, Pelzine, and many others.

Sold Only to

Graduate Veterinarians

Andalusia Serum Co.
Andalusia, Alabama

Arizona Veterinary Supply, Inc.
Mesa, Arizona

Arnold Laboratories
New Castle, Indiana

Austin Veterinary Supply
Fitchburg, Massachusetts

Blaine Drug Co.
South Ft. Mitchell, Kentucky

Research Laboratories
So. St. Paul, Minnesota

Carolina Veterinary Supply Co.
Charlotte, North Carolina

The Columbus Serum Co.
Columbus 7, Ohio

Curts Laboratories, Inc.
Kansas City 18, Kansas

Detroit Veterinary Supply Co.
Detroit 32, Michigan

Dougherty Supply Co.
Albany, Georgia

Edwards Veterinary Supply Co.
Kansas City, Missouri

Florida Veterinary Supply Co.
Tampa, Florida

J. D. Hacker Co.
Cleveland, Ohio

Haller & Company, Inc.
Chambersburg, Pennsylvania

Walter Harrison Veterinary Supplies
Miami, Florida

Holmes Serum Co.
Springfield, Ill.

Charles Horne Veterinary Supplies
Newton, Mississippi

Medical Supplies, Inc.
Silver Spring, Maryland

Missouri Valley Serum Co.
Kansas City 18, Kansas

Moultrie Serum Distributors
Moultrie, Georgia

Northland Veterinary Supply Co.
St. Paul 5, Minnesota

Osborn Laboratories, Inc.
LaSueur, Minnesota

Pioneer Laboratories
Houston, Texas

Rea Serum Co.
Tallahassee, Florida

Research Laboratories, Canada
Toronto, Canada

Standard Veterinary Products Co.
New York 1, New York

Texas Veterinary Specialty Co., Inc.
Austin, Texas

Wisconsin Biological Supply Co.
Madison, Wisconsin

COMING MEETINGS

Midwest Small Animal Association, annual meeting, and American Animal Hospital Association, regional meeting. Hotel Burlington, Burlington, Iowa, Nov. 18-19, 1956. J. Porter Coble, 2828 S. MacArthur Blvd., Springfield Ill., secretary, Midwest Small Animal Association.

U. S. Livestock Sanitary Association. Annual meeting. Morrison Hotel, Chicago, Ill., Nov. 28-30, 1956. R. A. Hendershott, 33 Oak Lane, Trenton 8, N. J., secretary.

Animal Care Panel. Annual meeting. Morrison Hotel, Chicago, Ill., Nov. 29-30, 1956. Robert J. Flynn, P.O. Box 299, Lemont, Ill., secretary.

Arizona Veterinary Medical Association. Annual meeting. Arizona Inn, 2200 East Elm St., Tucson, Dec. 3-4, 1956. John L. Hinds, 22 E. Ventura St., Tuscon, secretary.

Nebraska Veterinary Medical Association. Annual meeting. Hotel Lincoln, Lincoln, Dec. 3-5, 1956. W. T. Spencer, 1250 North 37th St., Lincoln, secretary.

Kentucky Veterinary Medical Association. Winter meeting. Phoenix Hotel, Lexington, Dec. 10-11, 1956. Robert H. Singer, 136 Shawnee Pl. Lexington, secretary.

Armed Forces Institute of Pathology. Postgraduate short course, pathology of diseases of laboratory animals. Armed Forces Institute of Pathology, Walter Reed Army Hospital, Washington, D. C., Dec. 10-14, 1956. The Director, Armed Forces Institute of Pathology, Walter Reed Army Medical Center, 6825 16th Street, N.W., Washington 25, D.C.

New York State Veterinary College. Annual conference for veterinarians. New York State Veterinary College, Cornell University, Ithaca, Jan. 2-4, 1957, W. A. Hagan, dean.

Pennsylvania, University of. Annual conference for veterinarians. School of Veterinary Medicine, 39th St. and Woodland Ave., Philadelphia, Pa., Jan. 8-9, 1957. M. W. Allam, dean.

Tennessee Veterinary Medical Association. Annual meeting. Memphis, Tenn., Jan. 13-15, 1957. H. W. Hayes, 5009 Clinton Pike, Knoxville, secretary.

Oklahoma Veterinary Medical Association. Annual meeting. Huckins Hotel, Oklahoma City, Jan. 14-15, 1957. M. N. Riemenschneider, 122 State Capitol Building, Oklahoma City, secretary.

Iowa Veterinary Medical Association. Annual meeting. Hotel Fort Des Moines, Iowa, Jan. 22-24, 1957. F. B. Young, Waukee, Iowa, secretary.

Intermountain Veterinary Medical Association. Annual meeting. Hotel Utah, Salt Lake City, Jan. 24-26, 1957. R. A. Bagley, 2387 E. 39th South, Salt Lake City, secretary.

Virginia Veterinary Medical Association. Annual meeting. Hotel John Marshall, Richmond, Va., Jan. 27-29, 1957. W. B. Bell, 1303 Hillcrest Dr., Blacksburg, secretary.

California State Veterinary Medical Association. Midwinter conference. School of Veterinary Medicine, University of California, Davis, Jan. 28-30, 1957. Charles S. Travers, 3004 16th St., San Francisco, executive secretary.

Louisiana State University. Conference for veterinarians. Pleasant Hall, Louisiana State University, Baton Rouge, Jan. 29-30, 1957. W. T. Oglesby, head, Department of Veterinary Science.

Minnesota State Veterinary Medical Association. Annual meeting. Radisson Hotel, Minneapolis, Feb. 4-6, 1957. B. S. Pomeroy, 1443 Raymond Ave., St. Paul 8, secretary.

New Jersey, Veterinary Medical Association of. Annual meeting. Berkeley Carteret Hotel, Asbury Park, Feb. 13-14, 1957. J. R. Porteus, P. O. Box 938, Trenton 5, N. J., resident secretary.

Illinois State Veterinary Medical Association. Annual meeting. LaSalle Hotel, Chicago, Feb. 26-27, 1957. C. B. Hostetler, 1385 Whitcomb Ave., Des Plaines, secretary.

(*Continued on p. 36*)

2 IMPROVED AIDS *for enteritis*

for more effective control of enteric conditions in: *Calves, Foals, Lambs, Pigs and Small Animals*

infectious ENTERITIS.....*KAO-TAN (Corn Belt)

with Sulfas

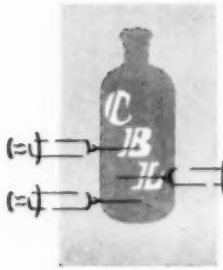
In addition to two outstanding enteric sulfas, *(Sulfaquanidine, Phthalylsulfacetamide)* and one time-proven systemic sulfa, *(Sulfathiazole),* KAO-TAN contains *Albumin Tannate,* an astringent which acts on all parts of the bowel, including the lower portions of the intestinal tract without *gastric irritation.*

It also contains *Kaolin,* an absorbent of gas, bacteria and toxins, to *increase fecal consistency.* And *Pectin* to form galacturonic acid which acts as a *direct detoxifier,* helps *thicken intestinal contents* and *soothe the intestinal tract.*

simple DIARRHEA.....*KAO-TAN (Corn Belt)

The same fine formula including Albumin Tannate but without the sulfas.

These two improved aids for the control of enteritis are new members of Corn Belt's own line of fine Pharmaceuticals. Trial bottles will be mailed on request without charge.



"Turn First to Corn Belt"
THE VETERINARIANS' INSTITUTION

Corn Belt Laboratories, inc.

EAST ST. LOUIS, ILLINOIS • TELEPHONE UPton 4-3333

Co-owner and Distributor of **Affiliated** *Brand Biologics*

good traveling companion
for faster, safer antibiotic therapy–

STECLIN
HYDROCHLORIDE

SQUIBB TETRACYCLINE HYDROCHLORIDE

- *broad spectrum anti-microbial activity*
- *fewer undesirable side effects*
- *3 easy-to-use forms*

HERE'S A SAFE AND EFFICIENT "LIFE SAVER"—One that makes the most of every minute you use "on call." It's Steclin Squibb. Keep an adequate supply in your bag, in its three easy-to-administer forms. Then, when broad spectrum antibiotic therapy is indicated, you know you're prepared to treat a wide range of diseases at a moment's notice, including those caused by gram-positive and gram-negative bacteria, spirochetes, certain rickettsias, and certain large viruses.

STECLIN IS UNUSUALLY WELL TOLERATED by both large and small animals, resulting in a remarkably low incidence of the gastro-intestinal side effects which often complicate recovery after therapy with other antibiotics. Steclin is promptly absorbed into the bloodstream, effectively penetrates body tissues and fluids including the cerebrospinal, peritoneal and pleural, and reaches high levels in the urine.

SUPPLY

New Steclin Soluble Powder is available in ½ lb. bottles, each containing 12½ grams tetracycline hydrochloride. *Also:*

CAPSULES: 50 mg., 100 mg., and veterinary sizes of 250 mg.

INTRAMUSCULAR: Veterinary sizes of 100 mg., 1 gram, 2.5 grams

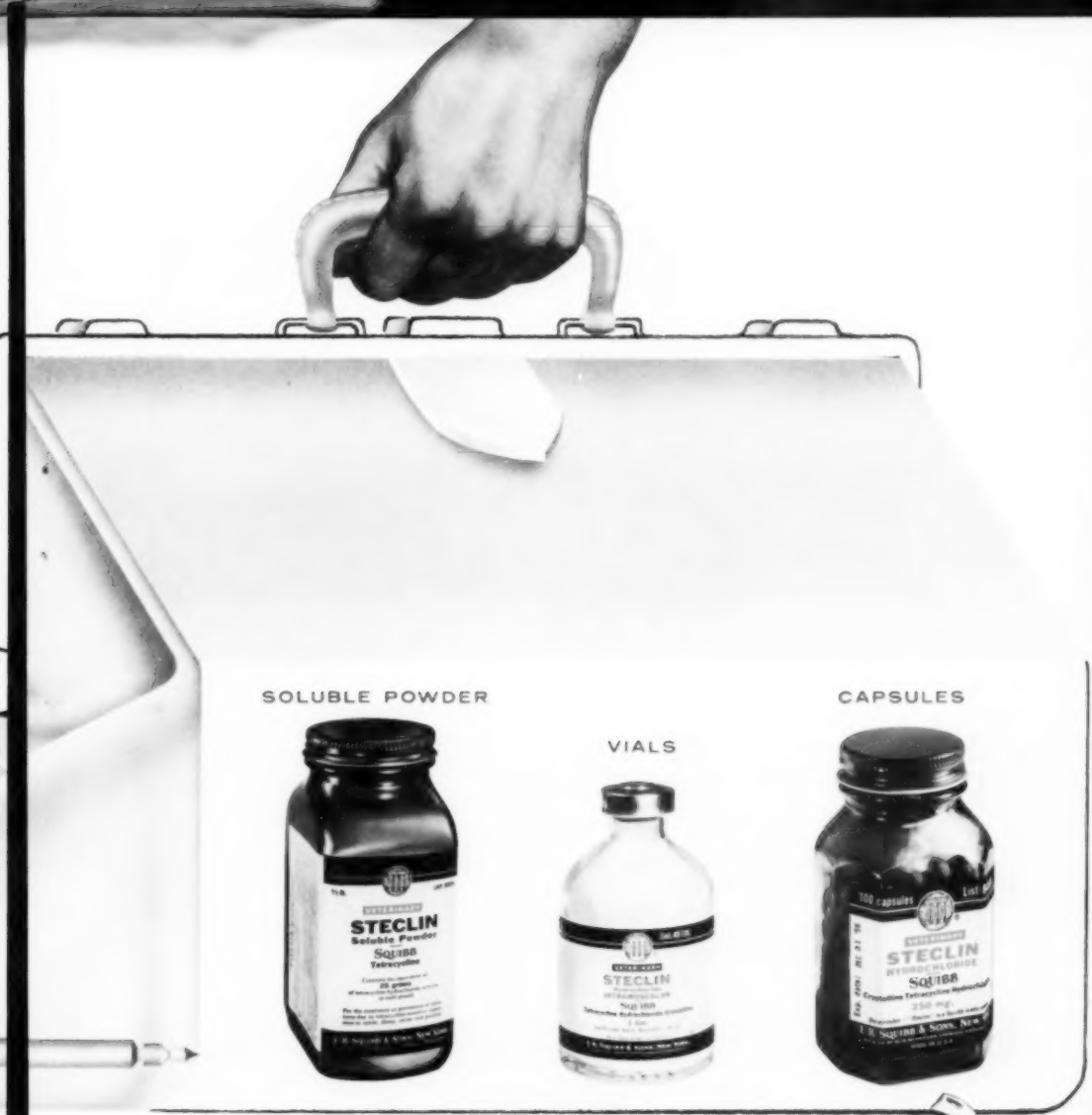
INTRAVENOUS: 250 mg., 500 mg.

DOSAGE:

ORAL: *Small animals*, 10-50 mg. per lb. of body weight per day in divided doses; *large animals*, 5-10 mg. per lb. of body weight per day.

IV OR IM: *Small animals*, 2-5 mg. per lb. daily; *large animals*, initially 2 grams followed by 1 gram daily for 3 or 4 days or until recovery.

STECLIN IS SOLD ONLY TO VETERINARIANS



SOLUBLE POWDER

VIALS

CAPSULES

INDICATIONS:

Steclin is indicated in the treatment of the following conditions when due to tetracycline-susceptible organisms:

Bacterial infections associated with canine distemper; bronchitis; calf scours; enteritis; equine influenza; erysipelas; feline enteritis; hemorrhagic septicemia; infectious coryza; influenza; lamb dysentery; leptospirosis in dogs; metritis; nephritis; otitis media; parotitis; peritonitis; pharyngitis; pneumonia; pyelonephritis; septic mastitis; staphylococcal and streptococcal infections in the foal; tonsilitis; ulcerations; upper respiratory complications; urinary tract infections.

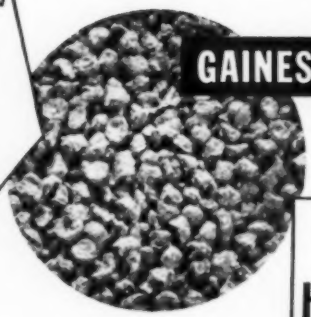
STECLIN IS AVAILABLE upon prescription from your pharmacy, through your wholesaler, or from your favorite veterinary supply house. For further information about Steclin, or other Squibb veterinary products, write: SQUIBB, *Veterinary Products Department*, 745 Fifth Avenue, New York 22, N. Y.

SQUIBB QUALITY

–THE PRICELESS INGREDIENT

Steclin® is a Squibb trademark.

the big difference here...



makes a big difference here...

Yes, Gaines makes the difference

because the special Gaines homogenizing process combines ingredients of the Gaines formula into appetizing granules—each granule containing uniform amounts of every food element dogs are known to need.

Gaines program of quality control, testing and research is an exacting and never-ending one. It results in what we honestly believe is the highest standard possible in the production of dog food. Gaines Homogenized Meal is far more assimilable, more palatable and much easier to feed . . . good reasons why Gaines is America's largest-selling dog meal.

Gaines indeed makes the difference . . . you can use Gaines with confidence . . . recommend Gaines with confidence . . . because complete and uniform nourishment is guaranteed.

A Product of General Foods

Gaines ***HOMOGENIZED*** **DOG MEAL**

formulated for performance

VISTREPCIN

A highly dispersible drinking water additive formulated for use in combatting necro-black scours, vibrio dysentery, bloody diarrhea, bacillary infections and shipping fever in swine; chronic respiratory disease, laying slumps, blue comb and weight losses in fowls; coughing, calf scours, pleurisy, shipping fever, bacillary dysentery and bronchitis in calves.

EACH POUND CONTAINS:

Procaine Penicillin G	1,000,000 Units
Streptomycin Sulfate (as base)	3.0 gms.
Riboflavin	400.0 mgs.
Calcium Pantothenate	600.0 mgs.
Niacin	1,400.0 mgs.
Vitamin B_{12}	1,000.0 mcgs.
Vitamin A (palmitate oil)	100,000 U. S. P. Units
Vitamin D_3	100,000 I. C. Units

(In an inert base)

VITASIL

A vitamin-trace mineral feed supplement formulated for use as an aid in the treatment of Vitamins A, D_2, D_3 and B_{12} deficiencies in livestock and poultry. Only stabilized vitamins that are protected by a specially prepared coating are used to prolong their activity.

EACH POUND CONTAINS:

Vitamin A	110,000 U. S. P. Units
Vitamin D_2	200,000 U. S. P. Units
Vitamin D_3	50,000 I. C. Units
Vitamin B_{12}	60 mcgs.
Terramycin Hydrochloride	50 mgs.
Manganese Sulfate	280 mgs.
Cobalt Sulfate	140 mgs.
Iron Sulfate	3 gms.
Copper Gluconate	300 mgs.
Calcium Phosphate	9.1 gms.

(In a wettable grain meal base with soy bean oil)

DI-OPTHO POWDER

Formulated for the effective use in the treatment of infectious keratitis (pink eye) of cattle. The refinement process of this powder allows greater surface action. It is packed in a unique two ounce puff-bottle that operates at any angle.

EACH BOTTLE CONTAINS:

Tyrothricin	0.05%
Sulfathiazole	20.0%
Sulfanilamide	78.95%
Phenacaine Hydrochloride	1.0%

GUAIACOL POWDER

Formulated as an expectorant to help loosen accumulated mucus in the upper respiratory tract of large animals. The action of this powder is more effective due to its homogenous blend.

EACH POUND CONTAINS:

Potassium Guaiacol Sulfonate	20%
Ammonium Chloride	30%
Potassium Dichromate	10%

(In a flavored sodium chloride base)

WARNER-CHILCOTT

New products developed exclusively for the veterinarian will soon be announced

Warner-Chilcott Laboratories is pleased to announce organization of its new DIVISION OF VETERINARY MEDICINE, with research, administrative, and production facilities located at Morris Plains, New Jersey.

1956 marks Warner-Chilcott's 100th year of service to the medical profession, producing ethical drugs and pioneering in pharmaceutical research.

Now, Warner-Chilcott serves the veterinary profession with products developed exclusively for and sold only to veterinarians through ethical veterinary distributors.

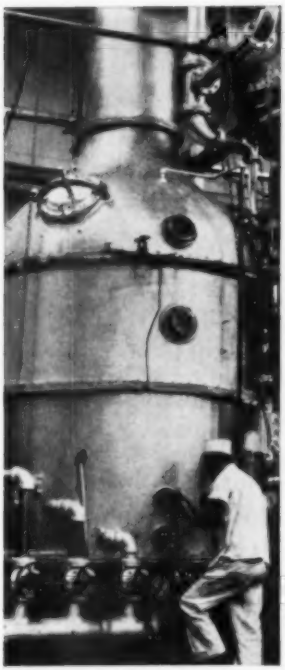
PRODUCT RESEARCH
Research is the backbone of Warner-Chilcott's growth and fine reputation in the medical field. Modern research facilities and outstanding personnel are now employed in the development of many valuable new products for the veterinary profession.

Division of Veterinary Medicine

now serves the veterinary profession

CLINICAL RESEARCH

Two new products, developed exclusively for the veterinarian, will soon be made available. These and other promising new medications are now under extensive clinical investigation by veterinarians and at universities and agricultural experiment stations throughout the country.



PRODUCTION

One hundred years of experience producing fine pharmaceuticals assure the veterinary practitioner of products, dosage forms, and packages designed specifically for his use. Every product for veterinary and human use undergoes extensive laboratory and clinical control. The highest standards of purity and effectiveness are maintained.

Warner-Chilcott veterinary products are developed for and sold only to veterinarians through ethical veterinary distributors.

WARNER-CHILCOTT *Laboratories*, MORRIS PLAINS, N. J.

(COMING MEETINGS—*continued from p. 32*)

Regularly Scheduled Meetings

ALABAMA—Central Alabama Veterinary Association, the first Thursday of each month. B. M. Lauderdale, Montgomery, secretary.

Jefferson County Veterinary Medical Association, the second Thursday of each month. S. A. Price, 213 N. 15th St., Birmingham, secretary.

Mobile-Baldwin Veterinary Medical Association, the first Tuesday of each month. W. David Gross, 771 Holcombe Ave., Mobile, Ala., secretary.

ARIZONA—Central Arizona Veterinary Medical Association, the second Tuesday of each month. Keith T. Maddy, Phoenix, Ariz., secretary.

Southern Arizona Veterinary Medical Association, the third Wednesday of each month at 7:30 p.m. E. T. Anderson, Rt. 2, Box 697, Tucson, Ariz., secretary.

CALIFORNIA—Bay Counties Veterinary Medical Association, the second Tuesday of each month. E. Paul, Redwood City, Calif., secretary.

Central California Veterinary Medical Association, the fourth Tuesday of each month. Wilfred Pimentel, 3455 S. Elm Ave., Fresno, Calif., secretary.

Association of East Bay Veterinarians, bimonthly, the fourth Wednesday. Leo Goldston, 3793 Broadway, Oakland 11, Calif., secretary.

Kern County Veterinary Medical Association, the first Thursday evening of each month. A. L. Irwin, 301 Taft Highway, Bakersfield, Calif., secretary.

Mid-Coast Veterinary Medical Association, the first Thursday of every even month. W. H. Rockey, P. O. Box 121, San Luis Obispo, Calif., secretary.

Monterey Bay Area Veterinary Medical Association, the third Wednesday of each month. Lewis J. Campbell, 90 Corral de Tierra, Salinas, Calif., secretary.

North San Joaquin Valley Veterinary Medical Association, the fourth Wednesday of each month at the Hotel Covell, in Modesto, Calif. Lyle A. Baker, Turlock, Calif., secretary.

Orange Belt Veterinary Medical Association, the second Monday of each month. Chester A. Maeda, 766 E. Highland Ave., San Bernardino, Calif., secretary.

Orange County Veterinary Medical Association, the third Thursday of each month. Donald E. Lind, 2643 N. Main St., Santa Ana, Calif., secretary.

Peninsula Veterinary Medical Association, the third Monday of each month. T. D. Harris, San Mateo, Calif., secretary.

Redwood Empire Veterinary Medical Association, the third Thursday of each month. Robert E. Clark, Napa, Calif., secretary.

Sacramento Valley Veterinary Medical Association, the second Wednesday of each month. W. E. Steinmetz, 4227 Freeport Blvd., Sacramento, Calif., secretary.

San Diego County Veterinary Medical Association, the fourth Tuesday of each month. H. R. Rossoll, 1795 Moore St., San Diego, Calif., secretary.

San Fernando Valley Veterinary Medical Association, the second Friday of each month at the Casa Escobar Restaurant in Studio City. John Chudacoff, 7912 Sepulveda Blvd., Van Nuys, secretary.

Southern California Veterinary Medical Association, the last Wednesday of each month. Don Mahan, 1919 Wilshire Blvd., Los Angeles 57, Calif., executive secretary.

Tulare County Veterinarians, the second Thursday of each month. R. B. Barsaleau, 2333 E. Mineral King, Visalia, Calif., secretary.

(*Continued on p. 38*)

Correspondence

August 2, 1956

Dear Sir:

In doing a large number of rumenotomies each year, we have made an interesting observation. If we have a wound on a hand when operating, its healing is accelerated and by the next day most of the soreness and inflammation is gone. We have our hands in the rumen juices about ten minutes per operation. We are wondering what is present in the rumen juices to produce this effect, also if it would have the same effect on stomach ulcers. Cows often have severe lesions in the reticulum or rumen which seem to heal quickly when the foreign body is removed. Perhaps this observation would suggest an interesting research project.

Yours truly,
s/MARVIN M. PRENTICE, D.V.M.
New Plymouth, Idaho.

COLORADO—Denver Area Veterinary Society, the fourth Tuesday of every month. Richard C. Tolley, 5060 S. Broadway St., Englewood, Colo., secretary.

Northern Colorado Veterinary Medical Society, the first Monday of each month. M. A. Hammarlund, School of Veterinary Medicine, Colorado A. & M. College, Fort Collins, Colo., secretary.

DELAWARE—New Castle County Veterinary Association, the first Tuesday of each month at 9:00 p.m. in the Hotel Rodney, Wilmington, Del. E. J. Hathaway, Clifton Park Manor, Apt. 73-5, Wilmington 2, Del., secretary.

FLORIDA—Central Florida Veterinary Medical Association, the second Friday of each month, time and place specified monthly. James B. Murphy, Eustis, Fla., secretary.

Jacksonville Veterinary Medical Association, the second Thursday of each month, time and place specified monthly. George F. Yopp, 4644 Main St., Jacksonville, Fla., secretary.

Northwest Florida Veterinary Medical Society, third Wednesday of each month, time and place specified monthly. Harold A. Tennant, Atmore, Ala., secretary.

Palm Beach Veterinary Society, the last Thursday of each month in the county office building at 810 Datura St., West Palm Beach. Ross E. Evans, 5215 S. Dixie Highway, West Palm Beach, Fla., secretary.

Ridge Veterinary Medical Association, the fourth Thursday of each month in Bartow, Fla. Paul J. Myers, Winter Haven, Fla., secretary.

South Florida Veterinary Society, the third Tuesday of each month, at the Seven Seas Restaurant, Miami, Fla. E. D. Stoddard, 6432 S. W. 8th St., Miami, Fla., secretary.

Suwannee Valley Veterinary Association, the third Friday of each month, at the Thomas Hotel, Gainesville, Fla. R. C. Mann, Rt. 1, Box 37, Ocala, Fla., secretary.

GEORGIA—Atlanta Veterinary Society, the second Tuesday of every month at the Elks Home on Peachtree St., Atlanta, Ga. J. L. Christopher, Smyrna, Ga., secretary.

ILLINOIS—Chicago Veterinary Medical Association, the second Tuesday of each month. Mark E. Davenport, Jr., 215 S. Edgewood Ave., LaGrange, Ill., secretary.

Eastern Illinois Veterinary Medical Association, the first Thursday of March, June, September, and December. A one-day clinic is held in May. H. S. Bryan, College of Veterinary Medicine, University of Illinois, Urbana, secretary.

INDIANA—Central Indiana Veterinary Medical Association, the second Wednesday of each month. Peter Johnson, Jr., 4410 N. Keystone Ave., Indianapolis 5, secretary.

Michiana Veterinary Medical Association, the second Thursday of every month, except July and December, at the Hotel LaSalle, South Bend, Ind. J. M. Carter, 3421 S. Main St., Elkhart, Ind., secretary.

Tenth District Veterinary Medical Association the third Thursday of each month. W. E. Sharp, Union City, Ind., secretary.

IOWA—Cedar Valley Veterinary Association, the second Monday of each month, except January, July, August, and October, at Black's Tea Room, Waterloo, Iowa. H. V. Henderson, Reinbeck, Iowa, secretary.

Coon Valley Veterinary Association, the second Wednesday of each month, September through May, at the Bradford Hotel, Storm Lake, Iowa. D. I. Lee, Sac City, Iowa, secretary.

Fayette County Veterinary Association, the third Tuesday of each month, except in July and August, at Pa and Ma's Restaurant, West Union, Iowa. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

Northeast Iowa-Southern Minnesota Veterinary Association, the first Tuesday of February, May, August, and November at the Wisneslick Hotel, Decorah, Iowa, 6:30 p.m. Donald E. Moore, Box 178, Decorah, Iowa, secretary.

(*Continued on p. 39*)

KENTUCKY—Central Kentucky Veterinary Medical Association, the first Wednesday of each month. L. S. Shirrell, Versailles Rd., Frankfort, secretary.

Jefferson County Veterinary Society of Kentucky, Inc., the first Wednesday evening of each month in Louisville or within a radius of 50 miles. W. E. Bewley, P.O. Box "H," Crestwood, secretary.

MARYLAND—Baltimore City Veterinary Medical Association, the second Thursday of each month, September through May (except December), at 9:00 p.m. at the Park Plaza Hotel, Charles and Madison St., Baltimore, Md. Harry L. Schultz, Jr., 9011 Harford Rd., Baltimore, Md., secretary.

MICHIGAN—Mid-State Veterinary Medical Association, the fourth Thursday of each month with the exception of November and December. Robert E. Kader, 5034 Armstrong Rd., Lansing 17, Mich., secretary.

Saginaw Valley Veterinary Medical Association, the last Wednesday of each month. S. Correll, Rt. 1, Midland, Mich., secretary.

Southeastern Veterinary Medical Association, the fourth Wednesday of every month, September through May. Gilbert Meyer, 14003 E. Seven Mile Rd., Detroit 5, Mich., secretary.

MISSOURI—Greater St. Louis Veterinary Medical Association, the first Friday of the month (except July and August) at the Sheraton Hotel, Spring Ave. and Lindell Blvd. Allen B. Shopmaker, 136 N. Meramec, Clayton 5, Mo., secretary.

Kansas City Small Animal Hospital Association, the first Monday of each month, at alternating hospitals. W. F. Noland, 7504 Metcalf, Overland Park, Kan., secretary.

Kansas City Veterinary Medical Association, the third Tuesday of each month at Exchange Hall, ninth floor, Livestock Exchange Bldg., 1600 Genessee St., Kansas City, Mo. Busch Meredith, 800 Woodswether Rd., Kansas City 5, Mo., secretary.

NEW JERSEY—Central New Jersey Veterinary Medical Association, the second Thursday of November, January, March, and May at Old Hights Inn, Highstown, N. J. David C. Tudor, Cranbury, N. J., secretary.

Metropolitan New Jersey Veterinary Medical Association, the third Wednesday evening of each month from October through April at the Academy of Medicine, 91 Lincoln Park South, Newark, N. J. Myron S. Arlein, 2172 Milburn Ave., Maplewood, N. J., secretary.

Northern New Jersey Veterinary Association, the fourth Tuesday of each month at the Casa Mana in Teaneck. James R. Tanzola, Upper Saddle River, secretary.

Northwest Jersey Veterinary Society, the third Wednesday of every odd month. F. B. Duke, 49 Taylor St., High Bridge, N. J., secretary.

Southern New Jersey Veterinary Medical Association, the third Tuesday of each month at the Collingswood Veterinary Hospital, Collingswood. W. E. Snyder, E. Kings Highway and Munn Ave., Haddonfield, secretary.

NEW YORK—New York City, Inc., Veterinary Medical Association of, the first Wednesday of each month at the New York Academy of Sciences, 2 East 63rd St., New York City. C. E. DeCamp, 43 West 61st St., New York 23, N. Y., secretary.

Monroe County Veterinary Medical Association, the first Thursday of even-numbered months except August. Irwin Bircher, 50 University Ave., Rochester, N. Y., secretary.

NORTH CAROLINA—Central Carolina Veterinary Medical Association, the second Wednesday of each month at 7:00 p.m. in the O'Henry Hotel, Greensboro. Joseph A. Lombardo, 411 Woodlawn Ave., Greensboro, secretary.

Eastern North Carolina Veterinary Medical Association.

(*Continued on p. 40*)

the first Friday of each month. Wm. Allen Potts, 401 W. James St., Mount Olive, secretary.

Piedmont Veterinary Medical Association, the last Friday of each month. John G. Martin, Boone, N. Car., secretary.

OHIO—Cuyahoga County Veterinary Medical Association, the first Wednesday of each month, September through May (except January), at 9:00 p.m. at the Carter Hotel, Cleveland, Ohio. Ed. R. Jacobs, 5522 Pearl Rd., Cleveland, Ohio, secretary.

OKLAHOMA—Oklahoma County Veterinary Medical Association, the second Wednesday of every month. James M. Brown, 2818 W. Britton Rd., Oklahoma City, secretary.

Tulsa Veterinary Medical Association, the third Thursday of each month in Directors' Parlor of the Brookside State Bank, Tulsa, Okla. Don L. Hohmann, 538 S. Madison St., Tulsa, Okla., secretary.

PENNSYLVANIA—Keystone Veterinary Medical Association, the fourth Wednesday of each month at the University of Pennsylvania School of Veterinary Medicine, 39th and Woodland Ave., Philadelphia 4, Pa. Raymond C. Snyder, 39th and Woodland Ave., Philadelphia 4, Pa., secretary.

SOUTH CAROLINA—Piedmont Veterinary Medical Association, the third Wednesday of each month at the Fairforest Hotel, Union, S. Car. Worth Lanier, York, S Car., secretary.

TEXAS—Coastal Bend Veterinary Association, the second Wednesday of each month. J. Marvin Prewitt, 6141 Lexington Blvd., Corpus Christi, Texas, secretary.

VIRGINIA—Central Virginia Veterinarians' Association, the third Thursday of each month at the William Byrd Hotel in Richmond at 8:00 p.m. M. R. Levy, 312 W. Cary St., Richmond 20, Va., secretary.

Northern Virginia Veterinary Society, the second Wednesday of every third month. Meeting place announced by letter. H. C. Newman, Box 145, Merrifield, Va., secretary.

Southwest Virginia Veterinary Medical Association, the first Thursday of each month. I. D. Wilson, Blacksburg, secretary.

WASHINGTON—Seattle Veterinary Medical Association, the third Tuesday of each month in the Trinity Episcopal Church, 8th and James St., Seattle, Wash. P. R. Des Rosiers, 5508 2nd Ave., N. W., Seattle 7, Wash., secretary.

South Puget Sound Veterinary Association, the second Thursday of each month except July and August. O. L. Bailey, P. O. Box 906, Olympia, Wash., secretary.

WEST VIRGINIA—Kyowva (Ky., Ohio, W. Va.) Veterinary Medical Association, the second Thursday of each month in the Hotel Prichard, Huntington, W. Va., at 8:30 p.m. Harry J. Fallon, 200 5th St., W., Huntington, W. Va., secretary.

WISCONSIN—Milwaukee Veterinary Medical Association, the third Tuesday of each month, at the Half-Way House, Blue Mound Rd. George F. Lynch, 201 West Devon St., Milwaukee 17, Wis., secretary.

Ordinary mastitis ointment remains in a blob, restricting the ability of the ingredients to reach the infection.

PROOF

Terramycin®* Animal Formula for Mastitis diffuses immediately into the infected quarter

Terramycin Animal Formula for Mastitis reaches the infection quickly with full broad-spectrum action.

These photographs of translucent plastic "quarters" show the exceptionally rapid diffusion of Terramycin Animal Formula for Mastitis contrasted with the restricted spread of ordinary ointments. This is one of the reasons Terramycin Animal Formula for Mastitis is not only *effective*, but is *fast*.

Supplied: Tubes of ½ oz. and 10-dose vials. Each gram contains 30 mg. of calcium dioxytetracycline and 10,000 units of polymyxin B sulfate.

*Brand of oxytetracycline

Department of Veterinary Medicine
PFIZER LABORATORIES
Division, Chas. Pfizer & Co., Inc.
Brooklyn 6, N. Y.

Pfizer

provides maximum protection against. canine distemper

CANINE IMMUNIZATION

Products to use:

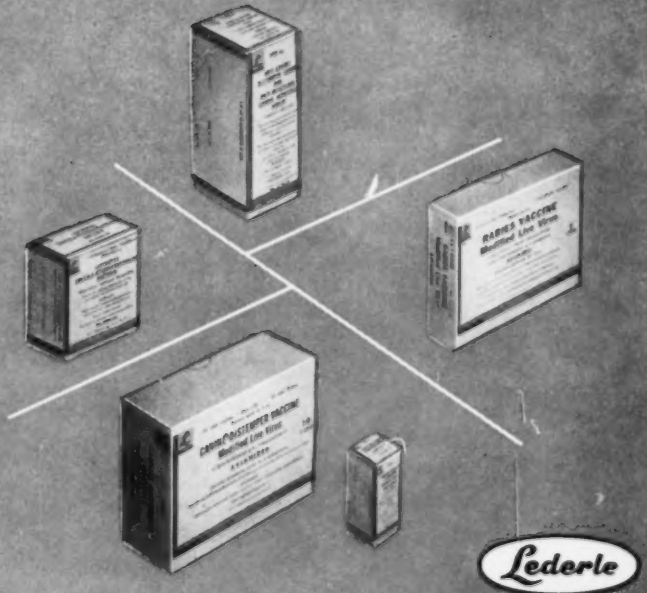
AVIANIZED® CANINE DISTEMPER VACCINE Modified Live Virus (Chick Embryo Origin-Vacuum Dried)

ANTI-CANINE DISTEMPER SERUM and ANTI-INFECTIOUS CANINE HEPATITIS SERUM (Canine Origin)

INFECTIOUS CANINE HEPATITIS VACCINE Canine Origin (Inactivated)

LEPTOSPIRA CANICOLA-ICTEROHEMORRHAGIAE BACTERIN (Whole Culture Inactivated)

AVIANIZED RABIES VACCINE Modified Live Virus (Chick Embryo Origin—Vacuum Dried)



Lederle

canine leptospirosis infectious canine hepatitis rabies

1 TO 2 WEEKS AFTER WEANING:
Antiserum and distemper vaccine.

2 WEEKS LATER:
Hepatitis and leptospirosis vaccines.

2 WEEKS LATER:
Second dose, hepatitis and leptospirosis vaccines.

6 TO 6 MONTHS:
Rabies vaccine.

PROGRAM

in small animal immunizations, provide a program of protection

Use Lederle-developed, potency-tested vaccines and antisera, designed to elicit solid, durable immunity during the post weaning period of maximum susceptibility.

Available to Veterinarians Only

The client pamphlet Protect Your Pet was prepared to save you valuable outpatient time. It will answer many of the commonly asked client questions for you. Keep a supply in your office or waiting room. Get them from your Lederle representative.

LEDERLE LABORATORIES DIVISION AMERICAN CYANAMID COMPANY PEARL RIVER, NEW YORK

CLASSIFIED ADVERTISEMENTS

Personal Want Ads—$4.00 for the first 25 words and 10 cents for each additional word; 35 cents for use of box number.

Commercial Want Ads—$5.00 for the first 25 words, 25 cents for each additional word.

Remittance must accompany ad.

Deadlines for Want Ads

For JOURNAL dated *1st* of month — 8th of month preceding date of issue.

For JOURNAL dated *15th* of month — 22nd of month preceding date of issue.

Names of classified advertisers using key letters can not be supplied. Address your reply to the key letters, c/o JOURNAL of the AVMA, 600 S. Michigan Ave., Chicago 5, Ill., and it will be transmitted to the advertiser.

Wanted—Veterinarians

Young, ambitious veterinarian wanted to assist in small animal practice. Good salary and working conditions. Permanent with good future. Address Dr. F. H. Saunders, 336 E. Lafayette St., Stockton 3, Calif.

Veterinary assistant wanted in small animal practice. Address Davis Animal Hospital, West Main St., Stamford, Conn.

Veterinarian wanted to assist in active small animal practice conducted in modern hospital now staffed by 2 veterinarians in suburb of New York City. Address "Box X 22," c/o JOURNAL of the AVMA.

Capable, energetic young veterinarian wanted for mixed practice in central Iowa. Start as partner; ownership in 1 year. Testing for tuberculosis now. Address "Box X 25," c/o JOURNAL of the AVMA.

Veterinarian wanted for a local meat inspection program and other duties in a city health department. Salary dependent upon training and experience; regular working hours, paid vacation, sick leave, insurance and retirement plan. Eligibility for Michigan license required. Address Director, City-County Health Department, City Hall, Kalamazoo, Mich.

Veterinarian wanted with Virginia license for small animal hospital in Arlington. Substantial salary for right man. Address Arlington Animal Hospital, 2624 Columbia Pike, Arlington 4, Va.

Veterinarian wanted with District of Columbia license for small animal clinic; 18-hour week. Good position for semi-retired man. Address "Box X 27," c/o JOURNAL of the AVMA.

Wanted—Positions

Experienced young veterinarian desires position in small animal practice leading to partnership or purchase. Licensed in Minnesota, Ohio, and Michigan. Married. Address "Box X 23," c/o JOURNAL of the AVMA.

(*Continued on p. 45*)

(CLASSIFIED ADS—*continued from p. 44*)

Veterinarian with experience in practice, virology, biological production research; writing, speaking, teaching, organizing abilities. Interested in industrial, academic, or research position. Address "Box X 6," c/o JOURNAL of the AVMA.

Veterinarian, 38 years old, seeks responsible position either with ethical pharmaceutical and/or biological company, or with reputable dog food company; Middlewest location preferred. Desire position which offers stimulus, challenge, and growth potential. Prefer position of clinical investigative nature in dog colony but will also consider professional service or extramural liaison work, other than sales, involving either limited or extensive travel. Professional experience entirely clinical and limited to dogs and cats; 14 years extensive small animal experience, including 10 years in busy Middlewest metropolitan practice, and staff positions on faculties of several United States veterinary colleges. Address "Box X 26," c/o JOURNAL of the AVMA.

Experienced 1953 Texas graduate desires position leading to partnership or purchase in mixed practice in Southwest; available in January.. Address "Box X 28," c/o JOURNAL of the AVMA.

Wanted—Practices

Small animal practice wanted by hard working, capable veterinarian; age 30, married. Will consider lease or partnership. Consider any good location. Address "Box W 26," c/o JOURNAL of the AVMA.

For Sale or Lease—Practices

Small animal clinic for sale in large Texas city; bargain price of $22,000 includes real estate and practice; $5,000 down plus drugs and equipment. Address "Box X 15," c/o JOURNAL of the AVMA.

Large animal practice for sale in small town, south central Minnesota; gross $25,000, 1955. Large clinic building on 4 acres of land; will sell for value of real estate and drugs; 8-room home also available. Address "Box X 20," c/o JOURNAL of the AVMA.

Small animal practice in Coral Gables, Fla., for lease at $4,800 annually to veterinarian with Florida license. Address Brown, 4 East 77 St., Apt. 5, New York, N.Y. Telephone, LE 5-0056.

(*Continued on p. 46*)

(CLASSIFIED ADS—*continued from p. 45*)

Modern small animal clinic and home for sale in north Texas, rich dairy-industrial center; only practitioner in county; gross, $25,000. Sale price, $26,500; $7,000 down, balance, 15 years. Inquire only if seriously interested. Address "Box X 21," c/o JOURNAL of the AVMA.

Fully equipped hospital for small and large animal practice for lease in central Alabama city of 27,500. Remodeled last year and 40 kennels added. Reason for sale, death of owner. Address "Box X 24," c/o JOURNAL of the AVMA.

To insure prompt delivery replies should be carefully addressed.

Long-established pet hospital on main boulevard for lease in fast growing suburb of Los Angeles; apartment included. Good 1-man practice; California license required. Give personal background. Address "Box X 30," c/o JOURNAL of the AVMA.

Mixed practice for sale in Wisconsin dairy region; 9-room home and separate hospital. Have grossed $65,000 in 4 years of practice. Address "Box X 29," c/o JOURNAL of the AVMA.

Miscellaneous

Precision clipper blade sharpening; Oster specialists, factory trained personnel. All work guaranteed; prompt service. Enclose 75 cents with each set of blades and avoid C.O.D. charges; mailed to you prepaid. Frick Precision Grinding Co., P.O. Box 348, Ardmore, Pa.

Breedersleve—The disposable obstetrical sleeve. Package of 25 with detachable chest band, $5.00; lower wholesale prices. Free sample upon request. Breeders Equipment Co., Flourtown, Pa.

Artificial Udder—Beco Litter Feeder—nurses 8 puppies simultaneously. Stays warm; easily cleaned and sterilized. Complete unit, $15; guaranteed. Breeders Equipment Co., Flourtown, Pa.

Pregnancy diagnosis in mares—45th to 150th day. Request mailing tubes; $7.00, 2 or more, $6.00 each. Pregnancy Diagnostic Laboratories, Dysart, Iowa.

Schering's First Veterinary Conference

The first veterinary symposium on Meticorten and Meticortelone will be held by Schering Corporation on November 29 and 30 in New York City, according to Dr. J. C. Siegrist, head of the Company's veterinary medical department.

Clinical papers on the use of meti-steroids for large and small animals will be presented by well-known veterinarians. In addition, papers will be presented by leading research scientists who are studying the compounds in veterinary research laboratories. Graduate veterinarians throughout the United States are invited to attend the two-day program.

The AVMA Will Pay 25 Cents Plus Postage for Each Copy of the Following:

JOURNAL OF THE AVMA—
June 15, July 15, Aug. 1, Aug. 15, 1956

AMERICAN JOURNAL OF VETERINARY RESEARCH—
Jan., April, 1955, July, 1956

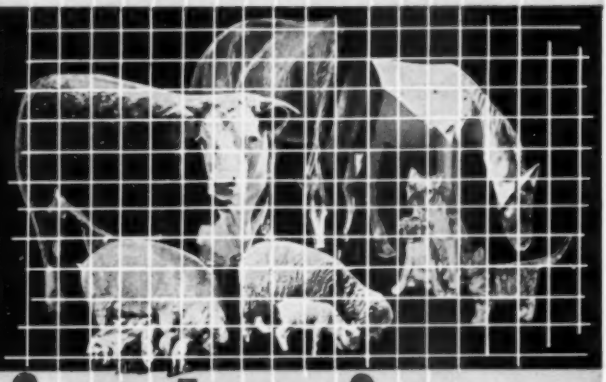
AMERICAN VETERINARY MEDICAL ASSOCIATION
600 S. Michigan Ave.
Chicago 5, Ill.

Index to Advertisers in This Issue

Abbott Laboratories	7
Affiliated Laboratories Corporation	9
Allied Mills	40
All-Pets Magazine, Inc.	37
Armour Veterinary Laboratories	15
Arnold & Sons, Veterinary Instruments, Inc.	22
Ashe Lockhart, Inc.	3rd cover
AVMA Directory	32
AVMA Emblems	37
AVMA Magazines Wanted	47
Corn Belt Laboratories, Inc.	Insert facing p. 32
Corn States Laboratories, Inc.	2nd cover
Diamond Laboratories	33
DuPont	16
Eaton Laboratories	29
Ford Kennel Equipment	38
Fort Dodge Laboratories	20
Fromm Laboratories, Inc.	10
Gaines Dog Food	Insert facing p. 33
Haver-Glover Laboratories	48
Hill Packing Company	47
Hyland Laboratories	6
International Minerals & Chemical Corp.	4
Jensen-Salsbery Laboratories, Inc.	4th cover
Kasco Mills	46
Kirschner Manufacturing Company	44
Lederle Laboratories	42, 43
MacAllan Laboratories	40
Merck Sharp & Dohme, Div. Merck & Co.	5
Motorola Communications & Electronics, Inc.	23
National Laboratories Corporation	17
Naylor Co., H. W.	39
Norden Laboratories	1
Parke, Davis & Company	21
Parlam Corporation	18
Pfizer Laboratories	11, 37, 41, 46
Pitman-Moore Company	3
Professional Printing Company, Inc.	22
Research Laboratories, Inc.	30, 31
Schering Corp.	Insert between pp. 16-17
Squibb	Insert between pp. 32-33
Stockwell Mfg. Co.	36
Swift and Company	12
Upjohn and Company	14
U.S. Chemical Co., Inc.	13
Warner-Chilcott Laboratories	34, 35
Whitmire Research Laboratories, Inc.	19
Wilmot Castle Company	45
WW Cattle Chute Company	45

A safe, dependable barrier protecting animals from histaminic actions . . . .

- Pulmonary edema
- Laminitis
- Photosensitization
- Anaphylaxis
- Urticaria
- Tympanites
- Bovine stomatitis
- Overloaded rumen
- Toxic indigestion
- Milk fever *(central nervous stimulation only)*
- White scours in calves *(after acute stage)*

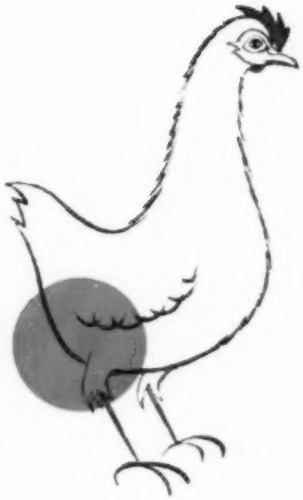


Antiphrine

Antiphrine provides a wide spectrum of efficacy for the symptomatic relief of many forms of allergies and related conditions. There are no undesirable side effects with Antiphrine. Antiphrine contains *Pyrilamine Maleate,* which is one of the most effective antihistamines, while *Ephedrine* is added to enhance and prolong its action.

Antiphrine may be given orally or parenterally. The solution can be injected for immediate action, while the tablets, Hextabs or Toytabs indicated for maintainance therapy. Antiphrine is excellent for dispensing.

HAVER-GLOVER *Laboratories* INCORPORATED



WHICH LOCKHART RABIES VACCINE SHOULD YOU USE?

CHICK EMBRYO ORIGIN

Modified Live Virus Rabies Vaccine prepared from the Flury strain of rabies virus, modified in virulence by passage in chick embryos.

This modified strain has demonstrated high immunizing ability in extensive field trials.

For use only in the immunization of healthy dogs against rabies.

OVINE ORIGIN

A sterile, neutral, phenolized 20% suspension prepared from the brain and spinal cord of animals showing typical symptoms of rabies following subdural injection of the fixed virus of rabies.

For the immunization of dogs and other animals against rabies.

YOU MAKE THE CHOICE!

LOCKHART

Lockhart now offers both vaccines for your consideration . . . you make the choice!

ASHE LOCKHART, INC. • 800 WOODSWETHER ROAD, KANSAS CITY 5, MO.

blood
calcium
levels
go

higher

and stay
high

longer

with

DCM

SPECIAL CONCENTRATION

DCM Special Concentration's exclusive, patented calcium salts make possible higher blood calcium and magnesium levels for longer periods. A free-flowing solution, DCM Special Concentration is low in toxicity and almost neutral in pH for minimum tissue irritation. Given intravenously, subcutaneously or intraperitoneally, DCM Special Concentration provides optimum calcium levels at only ½ cc. per pound of body weight. Supplied in cartons of 12—500 cc. vials. Specify "special concentration" on your order.

Jen-Sal

JENSEN-SALSBERY LABORATORIES, INC.
KANSAS CITY, MISSOURI